TECHNOLOGY DEPT.

Gas Journal

Vol. 271. 104th Year. LONDON, AUGUST 27, 1952. No. 4656. Price 1/3

Registered as a Newspaper

PUBLIC LIBRARY
SEP 18 1952
DETROIT

SPIRALLY-GUIDED

COLUMN-GUIDED

WATERLESS (M.A.N.) TYPE,

AND HIGH PRESSURE

GASHOLDERS

ILLUSTRATED IS A

SPIRALLY-GUIDED GASHOLDER

OF 5 MILLION CU. FT. CAPACITY

IN STEEL TANK, RECENTLY

ERECTED BY US.

OTHER MANUFACTURES INCLUDE—

PURIFIERS (CAST IRON, MILD

STEEL AND TOWER TYPES)

CONDENSERS, STATIC WASHERS

HORIZONTAL CARBONISING PLANT

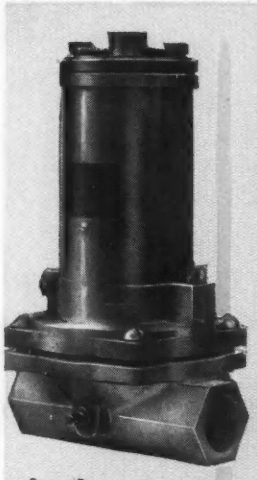
MECHANICAL HANDLING PLANT FOR

COAL, COKE AND OXIDE

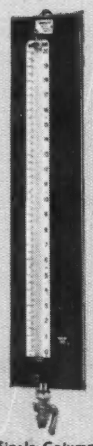
ROBERT DEMPSTER & SONS LTD. ELLAND, YORKS.

LONDON OFFICE: 57, TUFTON STREET, WESTMINSTER, S.W.1.

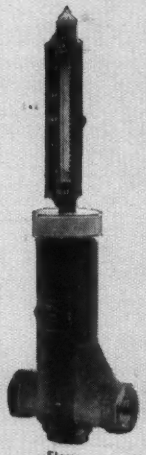
DE
DEMPSTER · ELLAND



Steam Pressure Operated Gas Control Valves



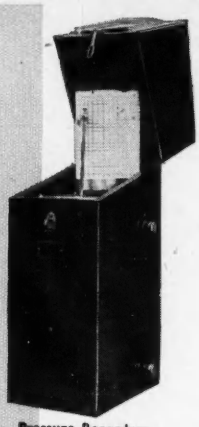
Single Column Pressure Gauge



Flow Indicators

Relay Valves

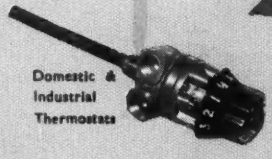
Cut-off Valves



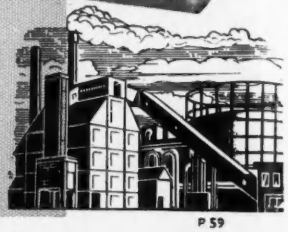
Pressure Recorders

THOMAS THORP & CO LTD
WHITEFIELD Manchester

Direct Reading Inclined Gauge



Domestic & Industrial Thermostats

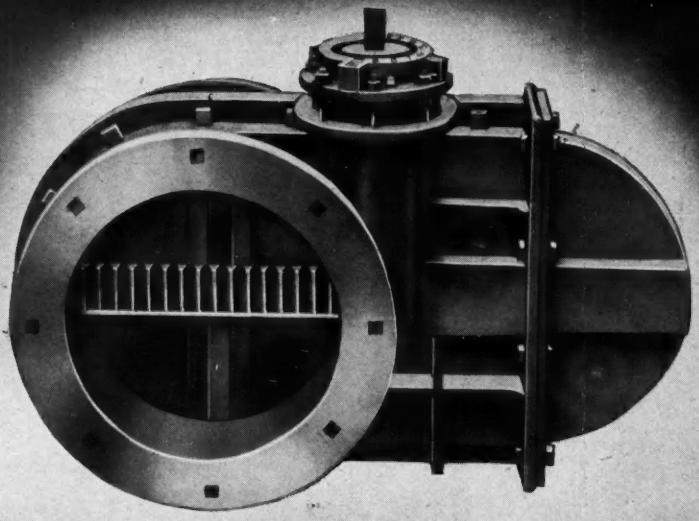


instrument specialists for the Gas Industry since 1877

P 59

GAS VALVES

The STANDARD DONKIN RACK and PINION LOW PRESSURE VALVE.



14,000 SOLD ANNUALLY

The **BRYAN DONKIN CO LTD · CHESTERFIELD**

LONDON · MANCHESTER · MEMBERS OF THE SOCIETY OF BRITISH GAS INDUSTRIES

TYPE J·47

ALUMINIUM SERVICE & APPLIANCE GOVERNOR

AVAILABLE IN SIZES 3/4" TO 2"

TELEPHONE: TIPTON 2161 (5 LINES)

JEAVONS ENGINEERING CO · TIPTON · STAFFS

PROPRIETORS · E.E. JEAVONS & CO. LTD

George Glover

& Co. Ltd.

DOMESTIC METERS

INDUSTRIAL METERS

GAS METERS

TEST METERS

CHELSEA

Branch works

LEEDS · MANCHESTER

Product of Radiation Ltd

They've got to be G

In the mass production of a gas meter good initial design is only half the story. Setting that design to high production standards is the next problem, and, finally comes the all-important matter of maintaining those standards through the life length of the particular production.

Rigid hour by hour material inspection, component inspection, and assembly inspection, in the Parkinson and Cowan factories, produce a meter that comes off the line identical with its fellows and built to a standard of quality that must give accurate registration over a long life.

OPTICAL PROJECTION
An Inspector projecting a worm for use in Gear Boxes. In this particular case a 50 'x 1 projection is being used.

DOUBLE CENTUR

GOOD !

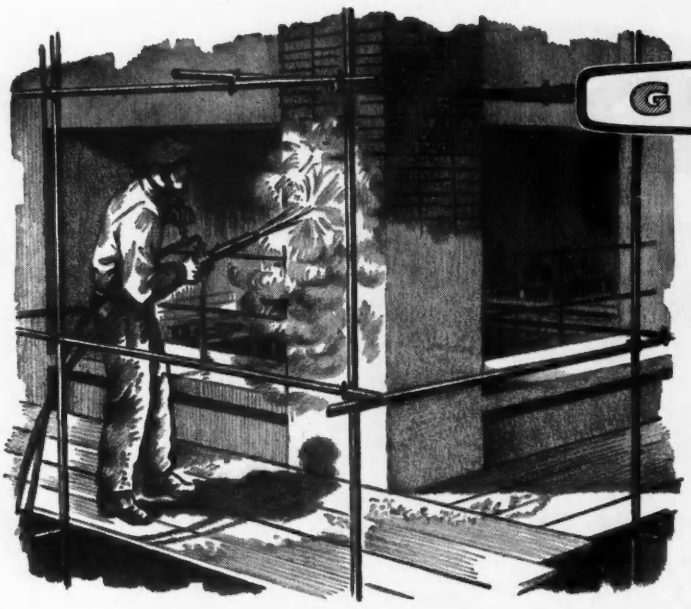
RAW MATERIAL INSPECTION
After all material specifications have been established during which the testing of instruments is maintained apart from operating also, as many as 60 detailed analyses are made in our laboratory before raw metal is accepted from our suppliers.

COMPONENT AND SUB-ASSEMBLY INSPECTION
An inspection operative checking concentricity on wheels and pinions before assembly into an index.

METER ASSEMBLY INSPECTION
During assembly the meter runs through no less than nine separate inspection Stations before reaching Ministry of Fuel and Power stamp.

METERS

PARKINSON & COWAN
(GAS METERS) LIMITED
TERMINAL HOUSE, GROSVENOR GARDENS, LONDON, S.W.1



GUNITE

The successful way to recondition defective concrete structures, encase structural steelwork, and line tunnels and water reservoirs. Developed and applied in all parts of the world with the resources, experience and skill of The Cementation Company, Ltd.

BY THE CEMENTATION Company Limited

BENTLEY WORKS · DONCASTER · Tel. DON. 54177-8-9

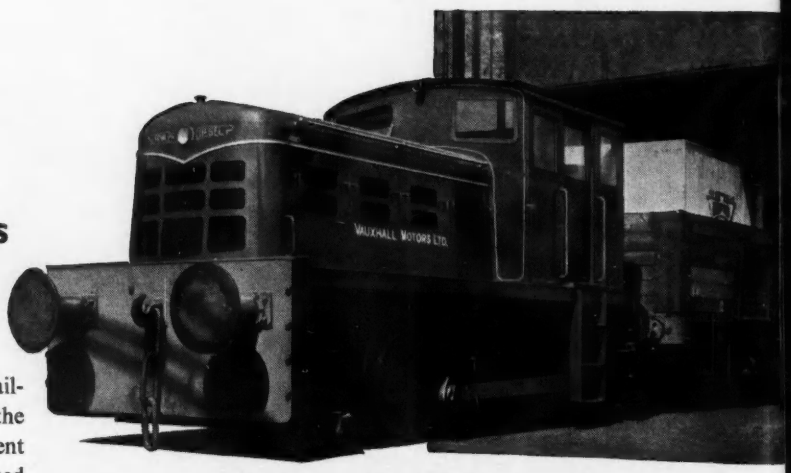
One of the 150 h.p.

FOWLER

Diesel Locomotives

at Vauxhall Motors Ltd.

Luton



THIS 150 h.p. supplies instantly available motive power. It provides the quick and efficient wagon movement which is a pre-requisite for increased overall productivity.

FOWLER LEEDS

DIESEL LOCOMOTIVES

In rail gauges from 2 ft. — 5 ft. 6 ins.

Information and literature from

John Fowler & Co. (Leeds) Ltd., Leeds, Yorks.

Telephone: Leeds 30731 (10 lines)

A PRODUCT OF THE MARSHALL ORGANISATION, GAINSBOROUGH, ENGLAND.

Some users of Fowler Diesel Locomotives

Anglo-Iranian Oil Co. Ltd., Llandarcy.
Associated Portland Cement Manufacturers Ltd.
Barrow Ironworks Ltd., Barrow-in-Furness.
Boots Pure Drug Co. Ltd., Nottingham.
British Aluminium Co. Ltd.
British Electricity Authority.
British Railways.
Cargo Fleet Iron Co. Ltd., Middlesbrough.
Cerebos Ltd., Co. Durham.
Colvilles Ltd., Motherwell.
Edward Curran & Co. Ltd., Cardiff.
Joseph Crosfield & Sons Ltd., Warrington.
Dorman, Long & Co. Ltd., Middlesbrough.
Enderby and Stoney Stanton Granite Co. Ltd., Nr. Leicester.
Fisons Ltd., Immingham and Avonmouth.
John Garrington & Sons Ltd., Bromsgrove.
Guest, Keen and Nettlefolds Ltd., Cardiff.
Richard Hill Ltd., Middlesbrough.
Imperial Chemical Industries Ltd.
Richard Johnson & Nephew Ltd., Manchester.
Michelin Tyre Co. Ltd., Stoke-on-Trent.
National Coal Board.
Nitrogen Fertilizers Ltd., Nr. Scunthorpe, Lincs.
North Bitchburn Fireclay Co. Ltd., Darlington.
North Devon Clay Co., Torrington.
North Eastern Gas Board.
Pressed Steel Co. Ltd., Cowley, Oxford.
"Shell" Refining & Marketing Co. Ltd.
Shell-Mex and B.P. Ltd.
Southern Oil Co. Ltd., Manchester.
The Steel Company of Scotland Ltd., Glasgow.
Thomas Summerson & Sons Ltd., Darlington.
Thames Board Mills Ltd., Purfleet.
Richard Thomas & Baldwins Ltd., Ebbw Vale & Swansea.
Vauxhall Motors Ltd., Luton.
West Midlands Gas Board, Stoke-on-Trent.
Whitehead Iron & Steel Co. Ltd., Newport, Mon.

COMPLETE GASWORKS PLANTS

Plate-Type Dearrer, Radcliffe, North Western Gas Board

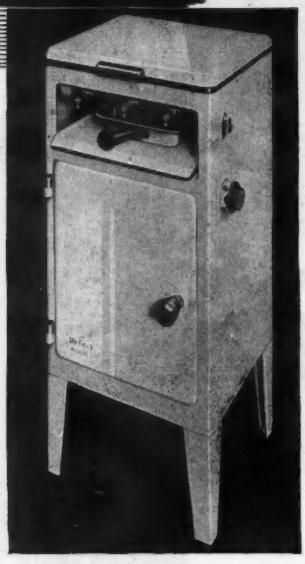
by Simon-Carves Ltd

SIMON ENGINEERING GROUP

STOCKPORT ENGLAND

A GREAT SUCCESS IN

Small kitchens and flats



The

Dainty

MINOR

This efficient little cooker of large capacity is made especially for small kitchens and flats.

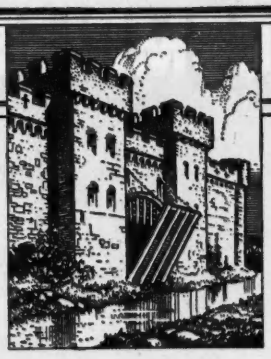
Its cast iron construction ensures durability and low maintenance cost.

For hire purchase or for simple hire the Dainty Minor is ideal.

Approved and adopted by leading gas boards.

R. RUSSELL & SONS LTD., DERBY.

Agents for Scotland & Northern Ireland:
JAMES R. THOMSON & CO. LTD, 41, York Street, Glasgow, C.2



PROTECTION

GAUNTLET

GAUNTLET

WEATHER TESTED PAINTS

ARCHD H. HAMILTON & CO. LTD

27-37 BARDOWIE STREET POSSILPARK GLASGOW N

for HIGH PRESSURE, COLUMN GUIDED

GASHOLDERS

RIVETTED OR WELDED

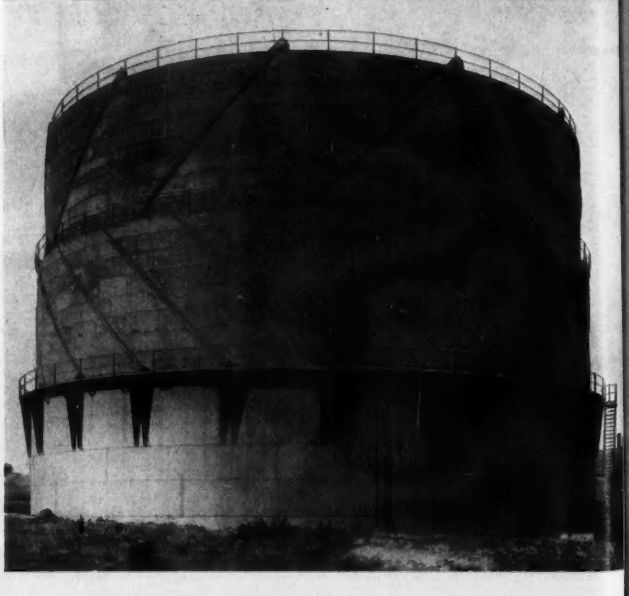
BLAKELEYS

Consult

FIRTH BLAKELEY SONS & CO LTD

CHURCH FENTON, YORKS

Telephone: BARKSTON ASH 234/5



Whatever the Specification

40 YEARS' SERVICE TO THE GAS INDUSTRY

Whatever the Specification and whatever the Service, Diameter, Length, Pressure, Temperature, Height or Depth, William Press & Son undertake Pipework installations anywhere. Expert and personal attention given immediately on request.

PIPEWORK *by* PRESS

William Press & Son Limited

22, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1
Telephone: WHitehall 1752-3 & 2961 Telegrams: Unwater, Parl, London

WILLOUGHBY LANE, TOTTENHAM, N.17
Telephone: TOTtenham 2665-8 Telegrams: Unwater, Southtot, London

FISHER

DIAPHRAGM MOTOR OPERATED
Butterfly Valves

Fisher pneumatically operated Butterfly Valves for control of gas and low-pressure fluids in the Gas Industry, Iron and Steel Works, Coke Oven and By-Products Plants. Made in sizes up to 24 inches. Of high-tensile iron or steel construction, these valves conform with the high standards of precision and performance characteristic of all Fisher products.

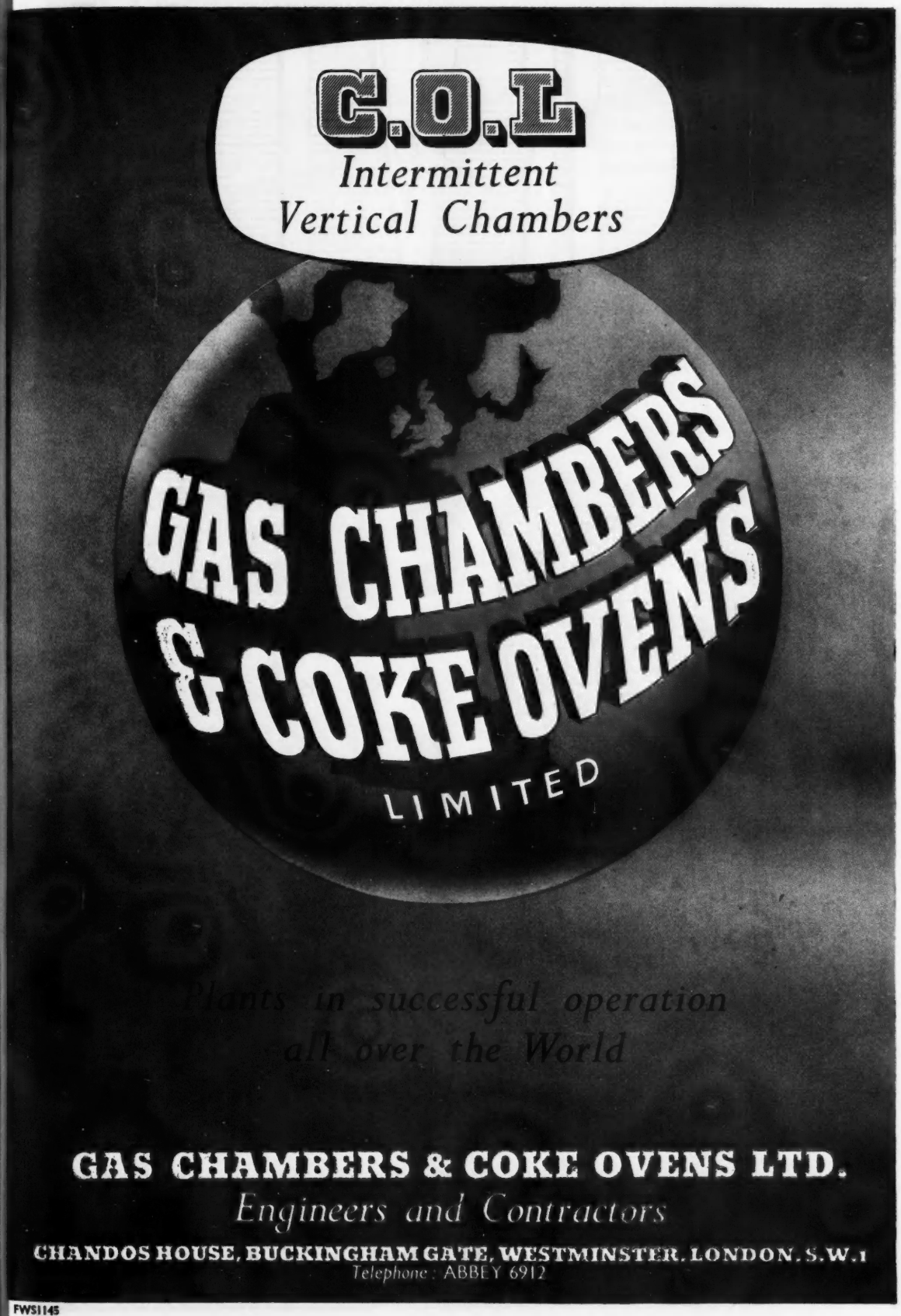
Send for Leaflet No. 60 B-G.

Fisher Valves, Level and Pressure Controllers are used extensively by the Gas, Petroleum and Chemical Industries, and in Power and Processing Plants throughout the world.

MADE IN ENGLAND BY

FISHER GOVERNOR COMPANY LIMITED

CENTURY WORKS, LEWISHAM, LONDON, S.E.13. • *Telephone:* TIDeway 3232


C.O.I
Intermittent
Vertical Chambers
GAS CHAMBERS
& COKE OVENS
LIMITED
Plants in successful operation
all over the World
GAS CHAMBERS & COKE OVENS LTD.
Engineers and Contractors
CHANDOS HOUSE, BUCKINGHAM GATE, WESTMINSTER, LONDON, S.W.1
Telephone: ABBEY 6912

FWS1145

SERVICE

FOR THE GAS INDUSTRY

MEMO
Purifier to be changed
Order Manox Oxide
IN CASE OF EMERGENCY DIAL THIS NUMBER
FOR FURTHER INFORMATION WRITE TO ADDRESS BELOW
MANOX LIMITED

HARDMAN & HOLDEN LIMITED

INCORPORATING MANCHESTER OXIDE CO LTD

MANOX HOUSE · MILES PLATTING · MANCHESTER · 10

TELEPHONES: COLLYHURST 1551 (11 LINES) • TELEGRAMS: OXIDE MANCHESTER

I thought I had one . . .

. . . too late when you reach the job to find you are short of essential tools. A complete range of equipment eliminates delay and inefficiency. You can meet your requirements easily by purchasing all your equipment from one source . . .

COMPLETE TOOL AND EQUIPMENT SERVICE FOR THE GAS INDUSTRY

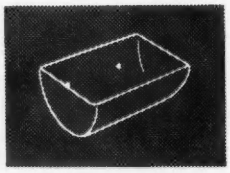
A typical Abbott Birks Tool

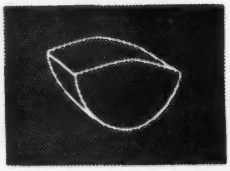
ABBOTT, BIRKS AND COMPANY LIMITED

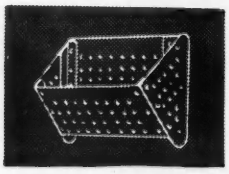
ABBIRKO HOUSE, 90-91 BLACKFRIARS RD., LONDON, S.E.1. TEL : WATERLOO 4066 (4 lines) GRAMS : ABBIRKO, SEDIST, LONDON

Exact
DUPLICATION
Even from a drawing

We never get into trouble with our duplicates. When it's a case of needing new Elevator Buckets, we can supply replacements either from a worn out or damaged sample, or, if necessary, from your drawings.


ANY SHAPE

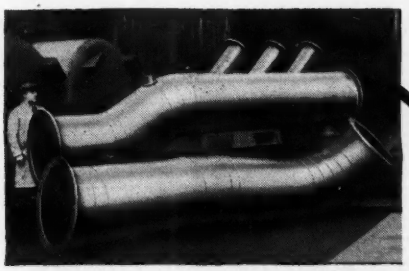

ANY SIZE


ANY QUANTITY

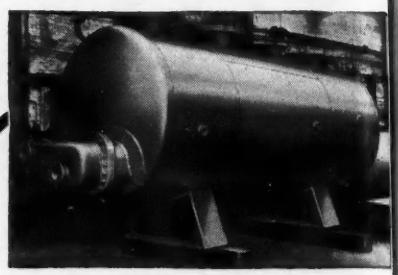
WE GUARANTEE A PERFECT REPLICA OF ANY TYPE OF ELEVATOR BUCKET

INGHAM FOR STRENGTH
JOHN INGHAM & SONS LTD.
MIDDLESTOWN · WAKEFIELD
Telephone: Horbury 49/50

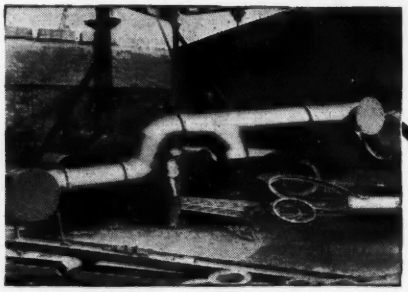
dm jl 70



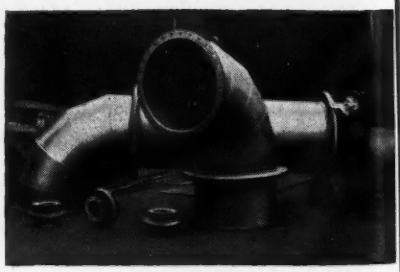
RILEYS
OF BATLEY



Manufacturers of Chemical Plant Pressure Vessels, Tanks, Pipes, Heat Exchangers. Fabricated plate work Welded or Riveted.

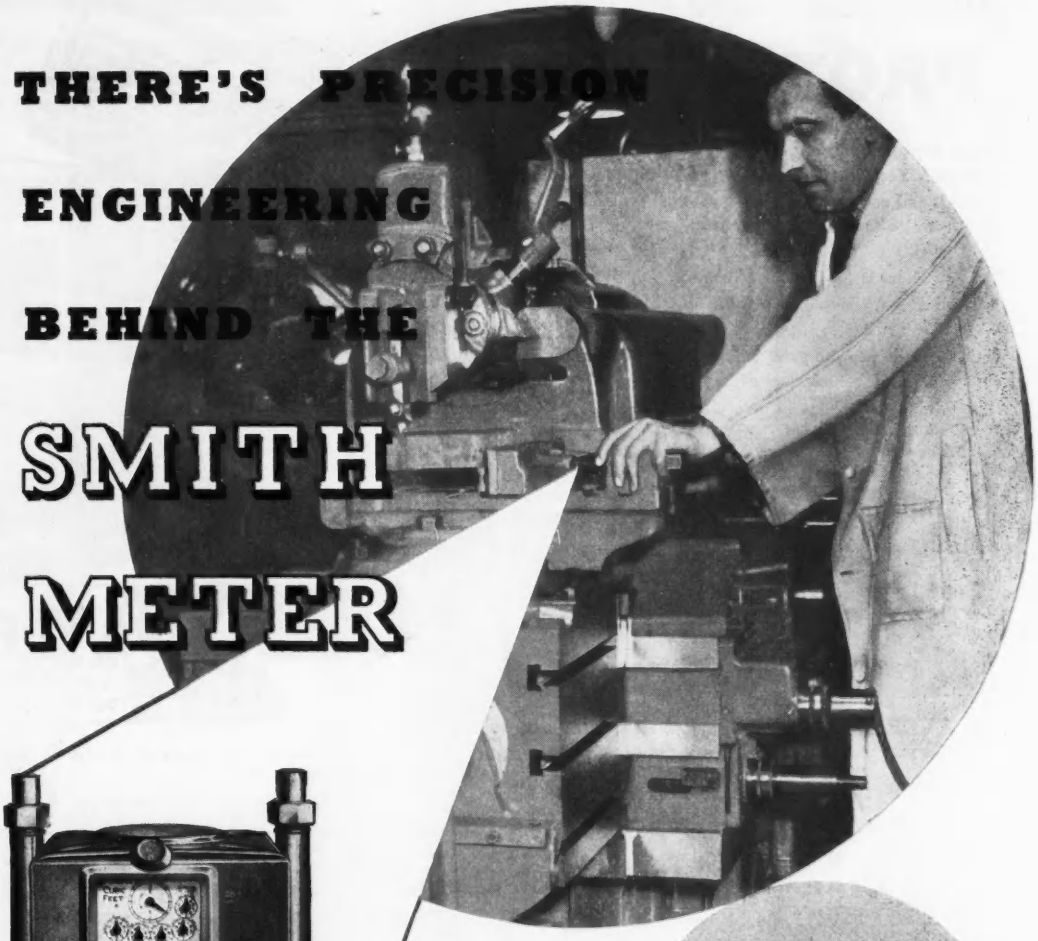


BOILER MAKERS
WELDING ENGINEERS



A. J. RILEY & SON LIMITED
VICTORIA WORKS, BATLEY, YORKS
TELEPHONE: BATLEY 657 (3 LINES)
TELEGRAMS: 'BOILERS BATLEY'

THERE'S PRECISION ENGINEERING BEHIND THE SMITH METER



Not just meters—but Smith Meters. There is the world of difference in the meters produced by high precision engineering at Smith Meters' works—which are fully equipped with the world's finest machines to give the gas industry a meter of unfailing accuracy and reliability.

SMITH METERS

DOMESTIC and INDUSTRIAL

SMITH METERS LTD. 186 Kennington Park Rd., London S.E11. Phone: RELiance 2447-8-9. Grams: Smieters, Lamb, London
Works: Kennington, S.E.11 and Streatham Vale, S.W.16. Northern Sales office: 3-4, East Parade, Leeds, 1. Phone: 23726.

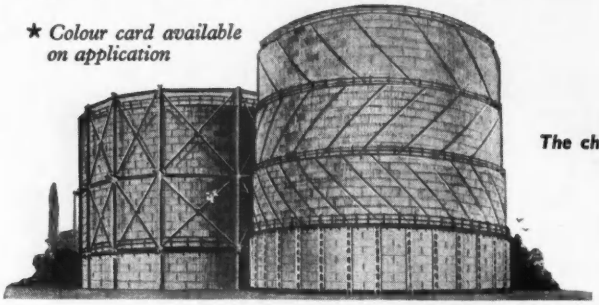
All-the-year round

PROTECTION . . .

Can any paint withstand extremes of temperature the whole year through? Yes, when it's AVARC Silica-Graphite Paint, because it expands and contracts without cracking.

AVARC Silica-Graphite paints, made to our own special formulæ, have been accepted as standard paints for iron and steelwork by Gas Undertakings, large Industrial Corporations, Railway Companies, Power Station Authorities and public undertakings throughout the world. With AVARC Paints the Silica-Graphite base has no chemical action with the vehicle. The paint dries with a hard leathery skin which allows for expansion and contraction of the metal in all weathers.

★ *Colour card available on application*



The cheapest paint per year of service

AVARC Silica – Graphite PAINT

C. R. AVERILL LIMITED ALYN MILLS, CAERGWRLE, WREXHAM, NORTH WALES.

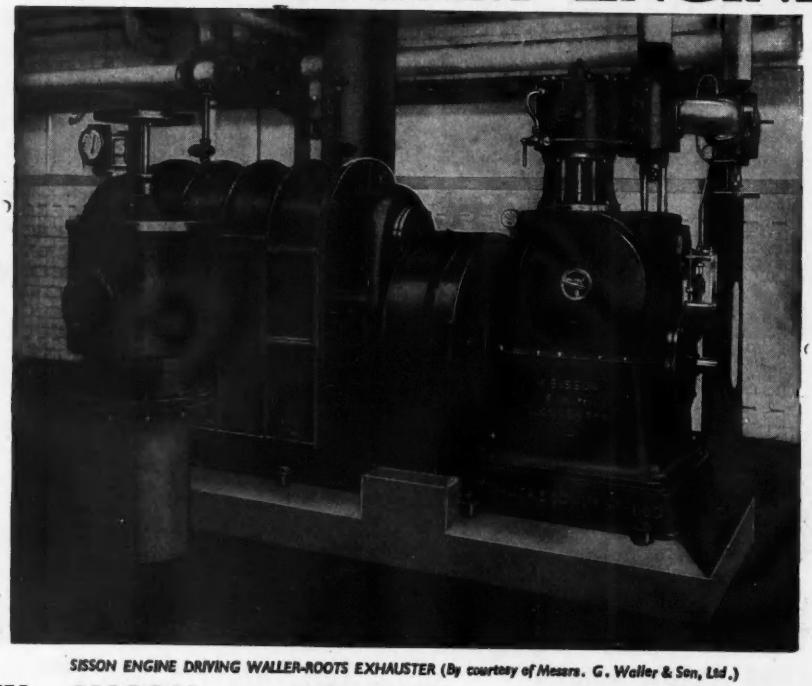
Tel: Caergwrle 14. Cable Address: Crucigraph, Caergwrle.

LONDON OFFICE: 52 BEDFORD ROW, W.C.1. Tel: HOLborn 5113.

AV1552

SISSON STEAM ENGINES

DESIGNED for driving EXHAUSTERS BOOSTERS COMPRESSORS ETC.



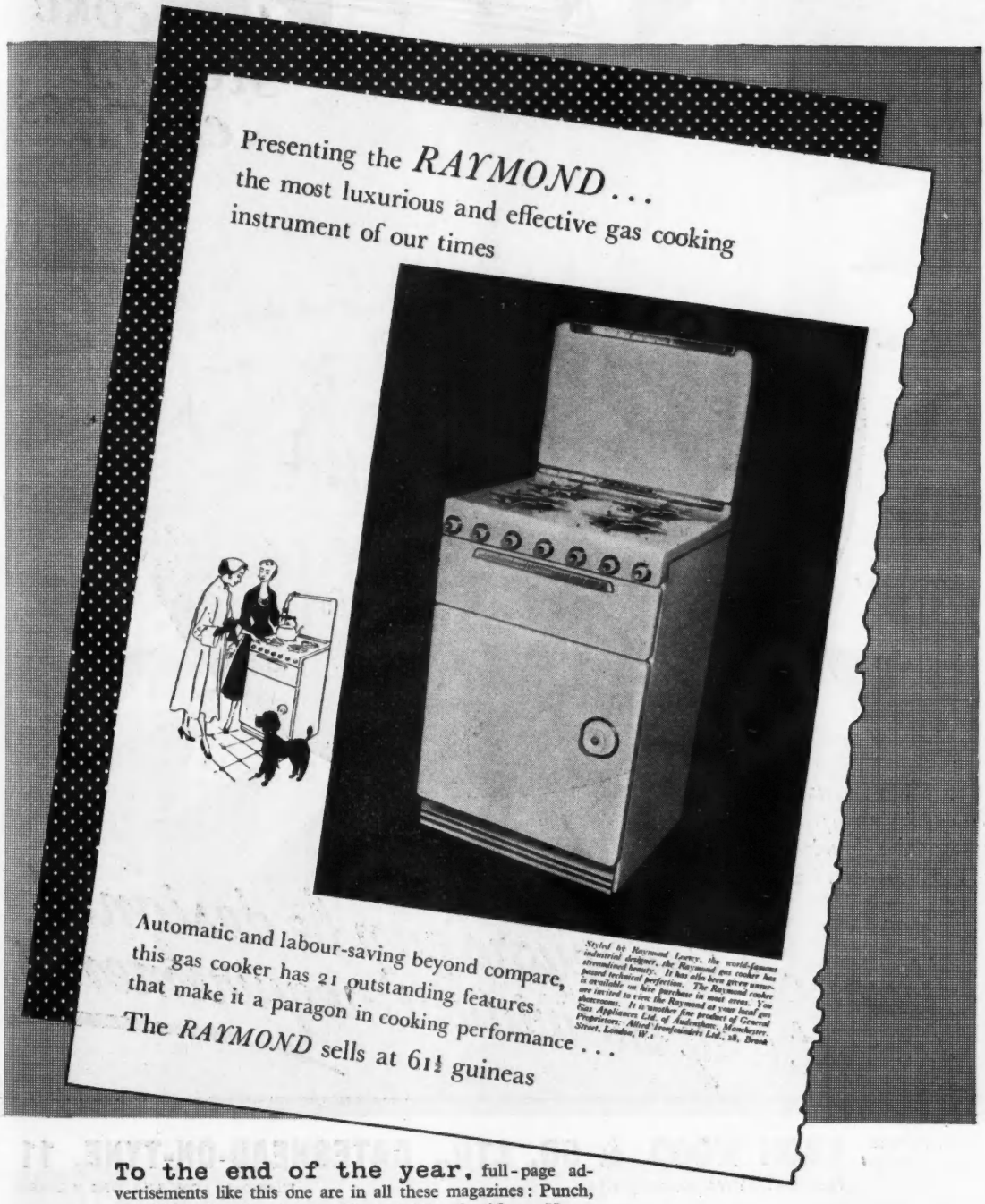
SISSON ENGINE DRIVING WALLER-ROOTS EXHAUSTER (By courtesy of Messrs. G. Waller & Son, Ltd.)

DEPENDABLE for NON-STOP DUTY

SUITABLE for GAS GOVERNOR or AUTOMATIC CONTROL

Telegrams:— SISSON. **W. SISSON & CO LTD.,** **Gloucester, Eng.** Telephones:— 22295-6.

INVITING THE PUBLIC to see the Raymond in your showrooms, there are full-page advertisements--see below--now appearing in leading publications. Don't disappoint the public. Do feature the Raymond gas cooker prominently.


Presenting the RAYMOND...
the most luxurious and effective gas cooking instrument of our times
Automatic and labour-saving beyond compare, this gas cooker has 21 outstanding features that make it a paragon in cooking performance...
The RAYMOND sells at 61½ guineas
Styled by Raymond Loewy, the world-famous industrial designer, the Raymond gas cooker has streamlined beauty. It has also been given unsurpassed technical perfection. The Raymond cooker is available on hire purchase in most areas. You are invited to view the Raymond at your local gas showrooms. It is another fine product of General Gas Appliances Ltd. of Audenshaw, Manchester. Proprietors: Allied Ironfounders Ltd., 28, Brook Street, London, W.1

To the end of the year, full-page advertisements like this one are in all these magazines: Punch, Good Housekeeping, Sphere, Illustrated London News, House & Garden, Homes & Gardens, Ideal Home, Woman's Journal.

THE RAYMOND GAS COOKER IS A PRODUCT OF GENERAL GAS APPLIANCES LTD., AUDENSHAW, MANCHESTER
Proprietors: Allied Ironfounders Ltd.
Trade Mark

Huwood Conveyors

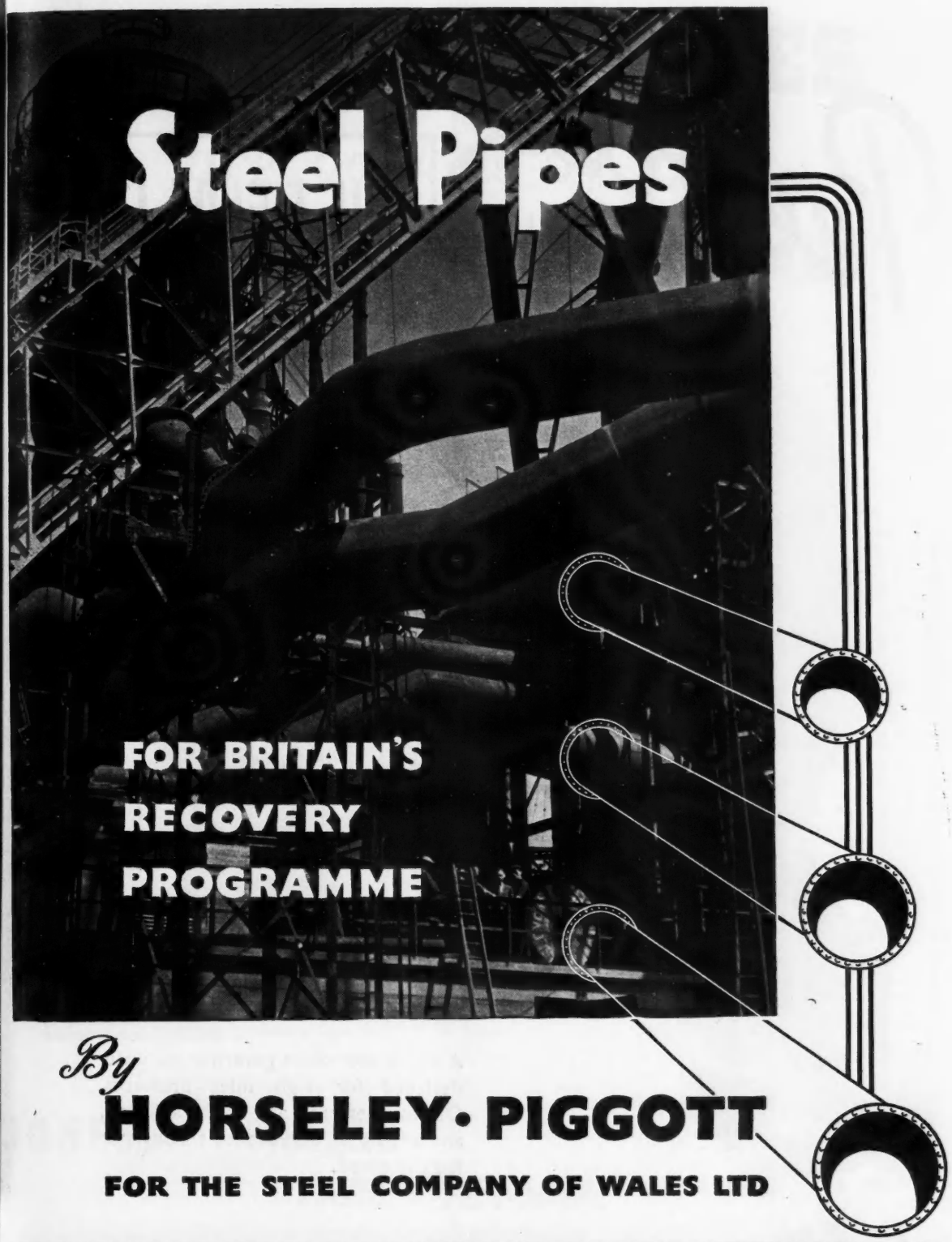
reduce coke storing charges

Illustration shows Huwood Top-Belt Conveyor stacking coke at the Howdon Works of the Northern Gas Board

Huwood Conveyors can be designed to suit any individual requirements

Head Office and Factories: **HUGH WOOD & CO. LTD., GATESHEAD-ON-TYNE, 11**
TELEGRAMS: HUWOOD, GATESHEAD TELEPHONE: LOW FELL 76083 (6 LINES)

Industrial and Export Office: **Hugh Wood & Co. Ltd., Dashwood House, 69 Old Broad St., London, E.C.2**
TELEGRAMS: HUWOOD, AVE, LONDON TELEPHONE: LONdon Wall 6631-2-3 (3 LINES)

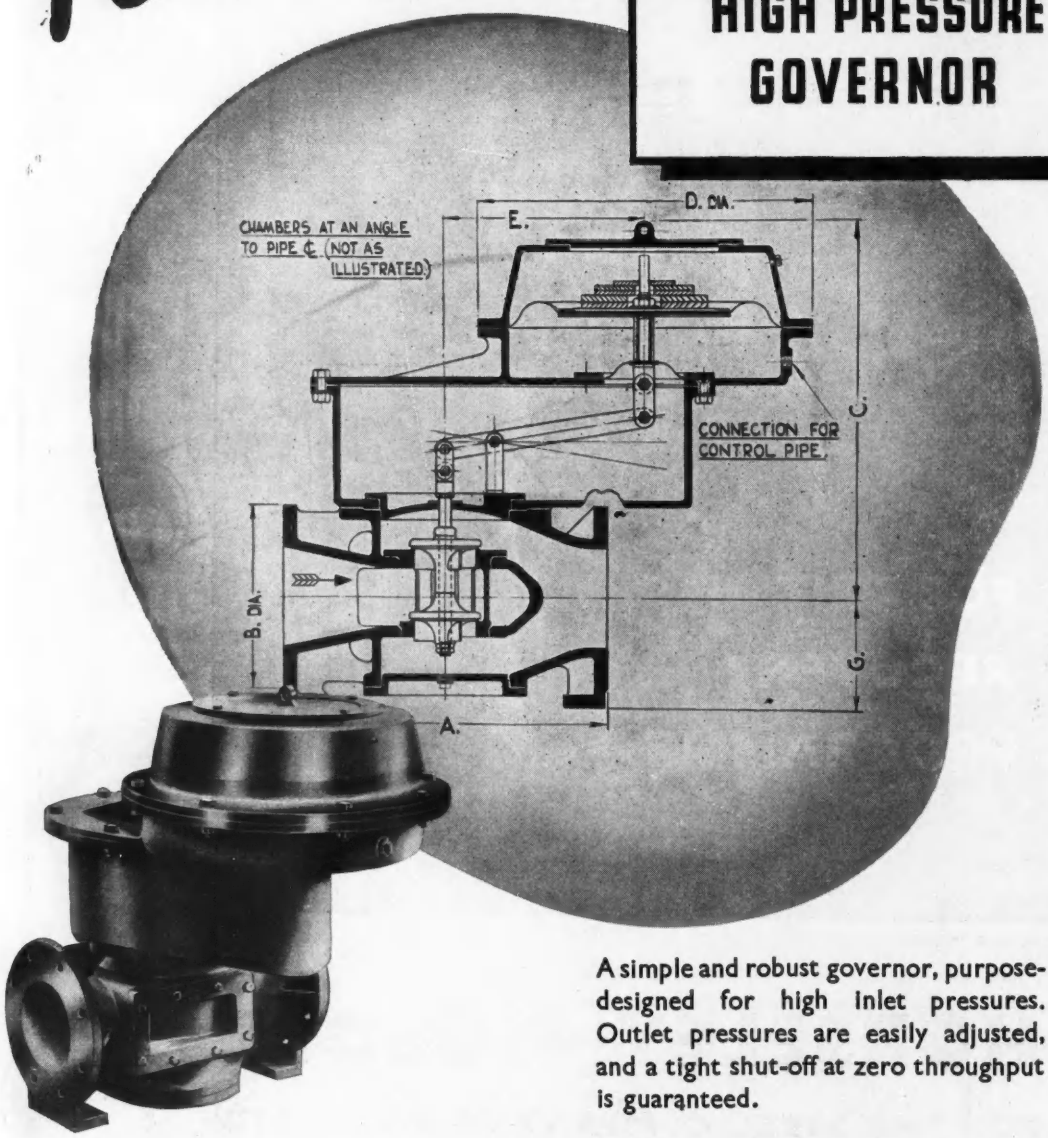


By
HORSELEY · PIGGOTT
FOR THE STEEL COMPANY OF WALES LTD

HORSELEY BRIDGE AND THOMAS PIGGOTT LTD
HORSELEY WORKS · TIPTON · STAFFS · PHONE 1104 P.B.X
CARTER-HORSELEY (ENGINEERS) LTD
NEWCASTLE · PHONE JESMOND 1450 · WADDON · PHONE CROYDON 7226
LONDON OFFICES · 9 VICTORIA STREET · WESTMINSTER · PHONE ABBEY 5905

Peebles & CO. LTD.

THE FIGURE 124
HIGH PRESSURE GOVERNOR



A simple and robust governor, purpose-designed for high inlet pressures. Outlet pressures are easily adjusted, and a tight shut-off at zero throughput is guaranteed.

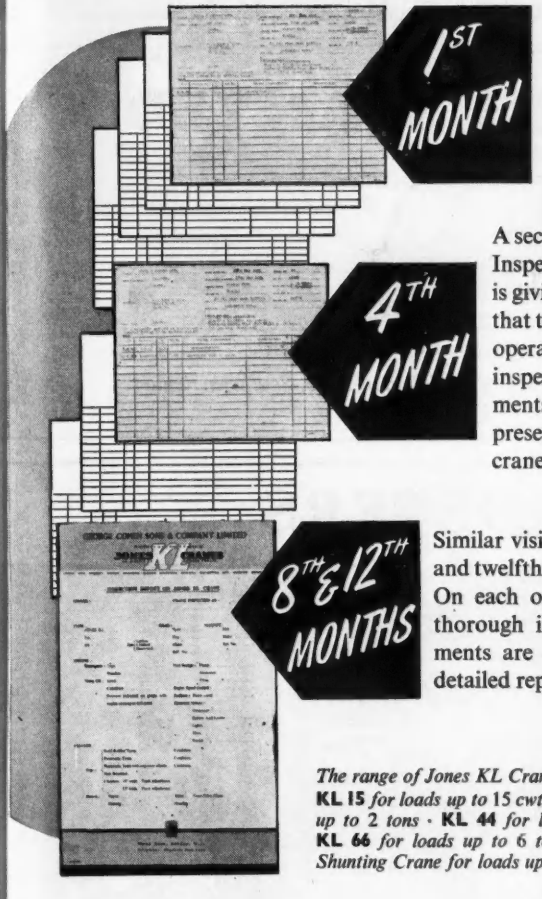
TAY WORKS, WEST BOWLING GREEN STREET, EDINBURGH, 6

Telephone Nos.: LEITH 36544 & 35069. Telegrams: "TANGENT, EDINBURGH."

JONES CRANES

are backed by this

FREE 'FOLLOW-THROUGH'



A Jones Cranes Service Inspector visits each new crane when it is delivered, to instruct the customer's driver how to operate and maintain it most efficiently. He stays as long as is necessary to ensure that the driver is absolutely competent.

A second visit is made by a Service Inspector to ensure that the crane is giving complete satisfaction, and that the driver fully understands its operation. The crane is thoroughly inspected, any required adjustments effected and a written report presented to the customer on the crane's condition and working.

Similar visits are made during the eighth and twelfth months from date of purchase. On each occasion, the crane is given a thorough inspection. Necessary adjustments are made there and then, and a detailed report presented to the customer.

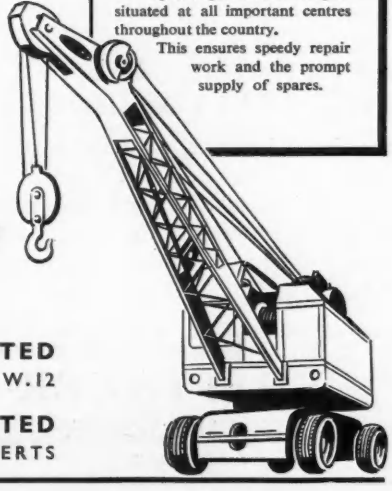
The range of Jones KL Cranes includes : **KL 15** *for loads up to* 15 *cwt* · **KL 22** *for loads up to* 2 *tons* · **KL 44** *for loads up to* 4 *tons* **KL 66** *for loads up to* 6 *tons* · **KL 100** *Rail Shunting Crane for loads up to* 5 *tons.*

THE JONES CRANE SERVICE COMPRISES:

1 A free-of-charge series of visits by Jones Service Inspectors during the first twelve months to advise on the best use of the crane, to inspect its condition and to make, without charge, necessary adjustments.

2 An extension of these visits (after the expiry of the twelve month guarantee period) at a nominal charge, as and when required by the user. The Inspector makes written reports to the user, and by subscribing to this service, the user ensures that the efficiency of his crane is fully maintained.

3 A mobile breakdown service operating from Service Depots situated at all important centres throughout the country. This ensures speedy repair work and the prompt supply of spares.



JONES KL CRANES *take the load!*

THE 600 GROUP OF COMPANIES

Distributed in the United Kingdom by :
GEORGE COHEN SONS & COMPANY LIMITED
WOOD LANE, LONDON, W.12

Designed, Manufactured and Exported by their Associates :
K & L STEELFOUNDERS & ENGINEERS LIMITED
LETCHWORTH, HERTS

GJ/527/131

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
REAVELL & CO. LTD. IPSWICH.

CASES FOR BINDING
Quarterly Volumes of the "Gas Journal."
5/- each, post free
Walter King, Ltd., 11, Bolt Court, Fleet Street, London, E.C.4.

GUNITE
PNEUMATICALLY PLACED CONCRETE
DENSE · DURABLE · HIGH STRENGTH
for
LININGS FOR STEEL
COAL & COKE HOPPERS
RESTORING DISINTEGRATED
CONCRETE STRUCTURES etc.
Get in touch with us for engineering data and estimates
THE GUNITE CONSTRUCTION CO. LTD.
WESTERN HOUSE, HITCHIN, HERTS. Tel. 571.

SCRAP GAS METERS WANTED

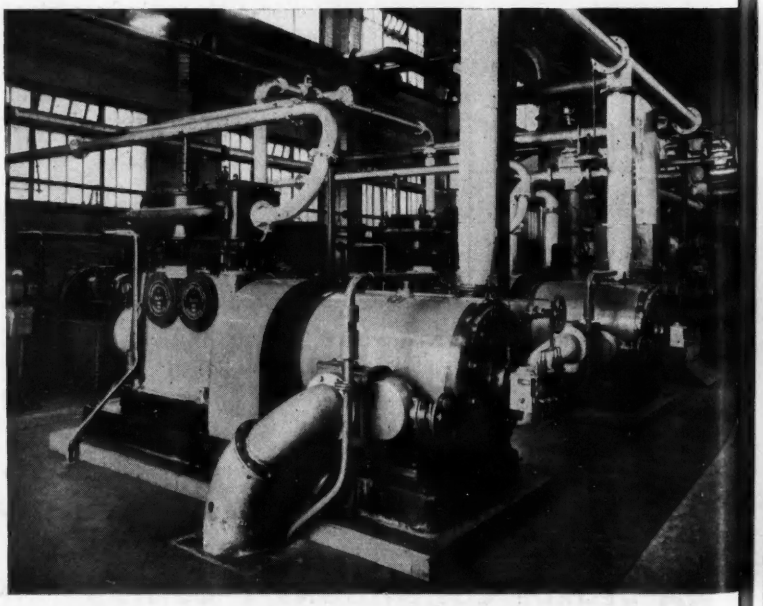
Top prices paid—Collection arranged from anywhere in U.K.

Sell to those best suited to deal with them.

Sell to — MITCHAM SMELTERS LIMITED
Rometal Works, Red House Road,
Mitcham Road . . . CROYDON . . . Surrey.
Tel: THOrnton Heath 6101. (Private Branch Exchange).

Truck Loads to our own private siding, Beddington Lane, Southern Region.

ROTARY GAS BOOSTERS



STEAM ENGINE DRIVEN ROTARY GAS BOOSTERS

in service 24 hours per day boosting about 1,250,000 cubic feet per day of purified coke oven gas to 13 lbs. per square inch pressure for long distance transmission from Bircotes near Doncaster to Worksop.

By courtesy of the National Coal Board (Carbonisation Branch, East Midlands Division).

WHITTAKER HALL & CO. (1929) LTD.
BLACK LANE WORKS, RADCLIFFE, MANCHESTER
Telephone: Radcliffe 2421-2
London Office:
119, Victoria Street, S.W.1. Tel. VICtoria 2612.
Telegrams: Clutch, Radcliffe, Manchester

The Sigma

SPECIFIC GRAVITY RECORDER

No. 7.

For use in the Retort House, Exhauster House, or the Laboratory

The SIGMA Specific Gravity Recorder measures the buoyancy of a column of gas 6 ft. high by 10 ins. diameter (1830 mm. x 254 mm.) and records the specific gravity on a controlled movement chart.

The Recorder is sensitive and robust. Whilst the standard range of chart ruling is for s.g. ·4 to ·65 other ranges are available.

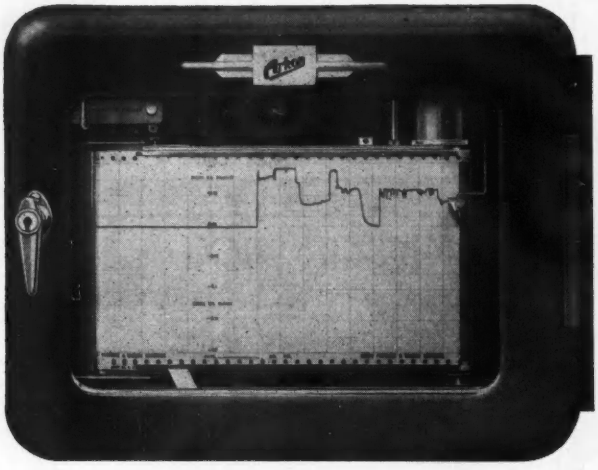
Please write for fully descriptive leaflet No. 10.

SIGMA
INSTRUMENT CO. LIMITED

Instrument Makers for the Gas Industry

LETCHWORTH · HERTFORDSHIRE

FWS 220



For

Draught, Pressure and Flow Measurement

CHOOSE THE

Arkon

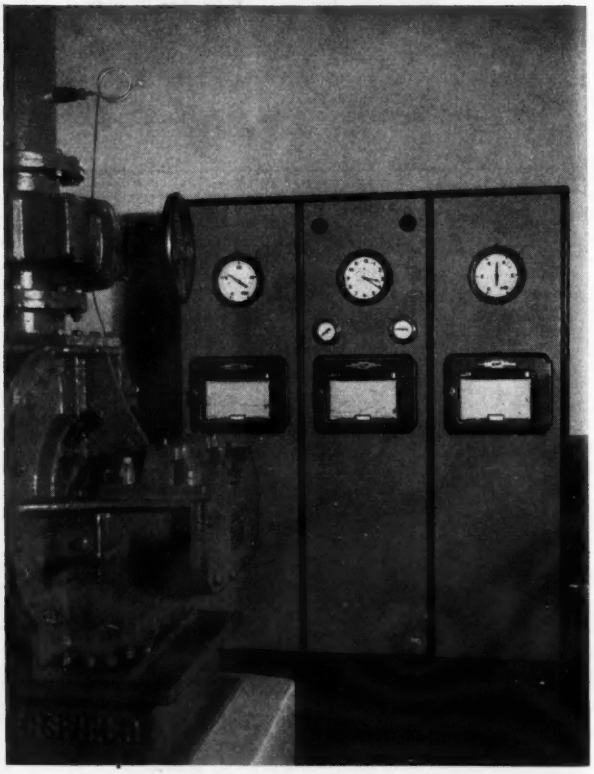
Model 1600 and Model 1601

The ARKON Model 1600 is a new instrument for measuring and recording pressure or draught or a combination of both. It offers a high degree of accuracy, great sensitivity and a high magnification of very low readings.

The ARKON Model 1601, sister instrument to the ARKON Model 1600, is designed for the measurement of gas or air flow. The differential pressure created by an orifice plate inserted in the main actuates the instrument, which registers in terms of flow rate. Like the Model 1600 it is highly responsive and will give full scale deflection on very low differentials.

The wide rectangular chart of the ARKON Models 1600 and 1601 is easily read by unskilled operators. The chart mechanism has many new features which permit a close and continuous record to be maintained with a minimum of attention.

A simple design combined with a robust construction makes these instruments particularly suitable for work under difficult conditions as in gas works, coke oven plants, steel works, foundries, etc.

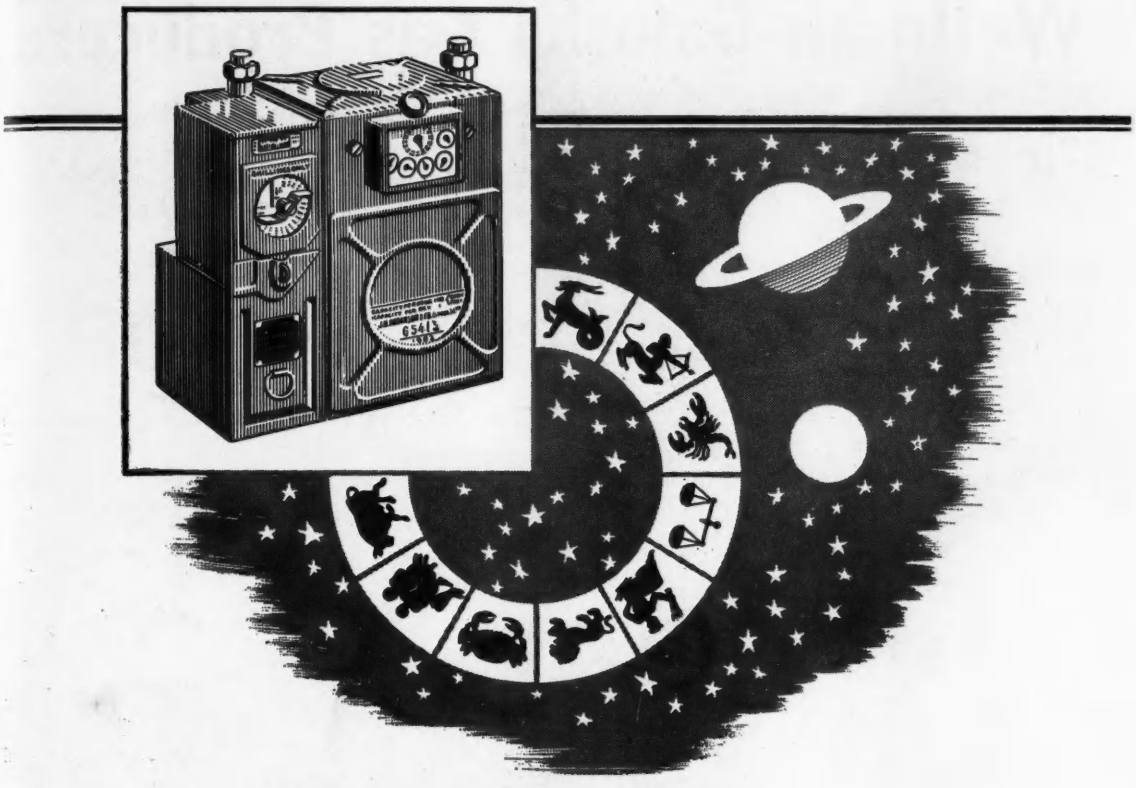


Please write for our Pamphlet No. PM/25

WALKER, CROSWELLER & COMPANY LIMITED

CHELTENHAM, GLOUCESTERSHIRE *Telephone: Cheltenham 5172*

London Office: HOLborn 2986 **Manchester Office: Blackfriars 0058**



UNVARYING ACCURACY

At 2.15 a.m. on 23rd September 1952 the sun enters the sign of Libra (The Balance).

To look at the stars is a never-ending source of wonder; wonder at their age; wonder at the extent of their distance; wonder, too, at the accuracy with which their distances can be measured and their movements calculated.

When you think of accuracy — remember Robinson's.

ROBINSON METERS and ALLIED APPARATUS

J. H. ROBINSON & CO. (LIVERPOOL) **LTD.**
Head Office: **Mill Lane, Old Swan, Liverpool, 13.**
Sales Office: **85, Mosley Street, Manchester, 2.**

Meter Components:
INDICES, UNIONS, ETC.
GAS and WATER FITTINGS
'AINTREE' WATER HEATERS

Office and Works for Scotland: **3-5, Nicoll Place, Edinburgh, 6.**

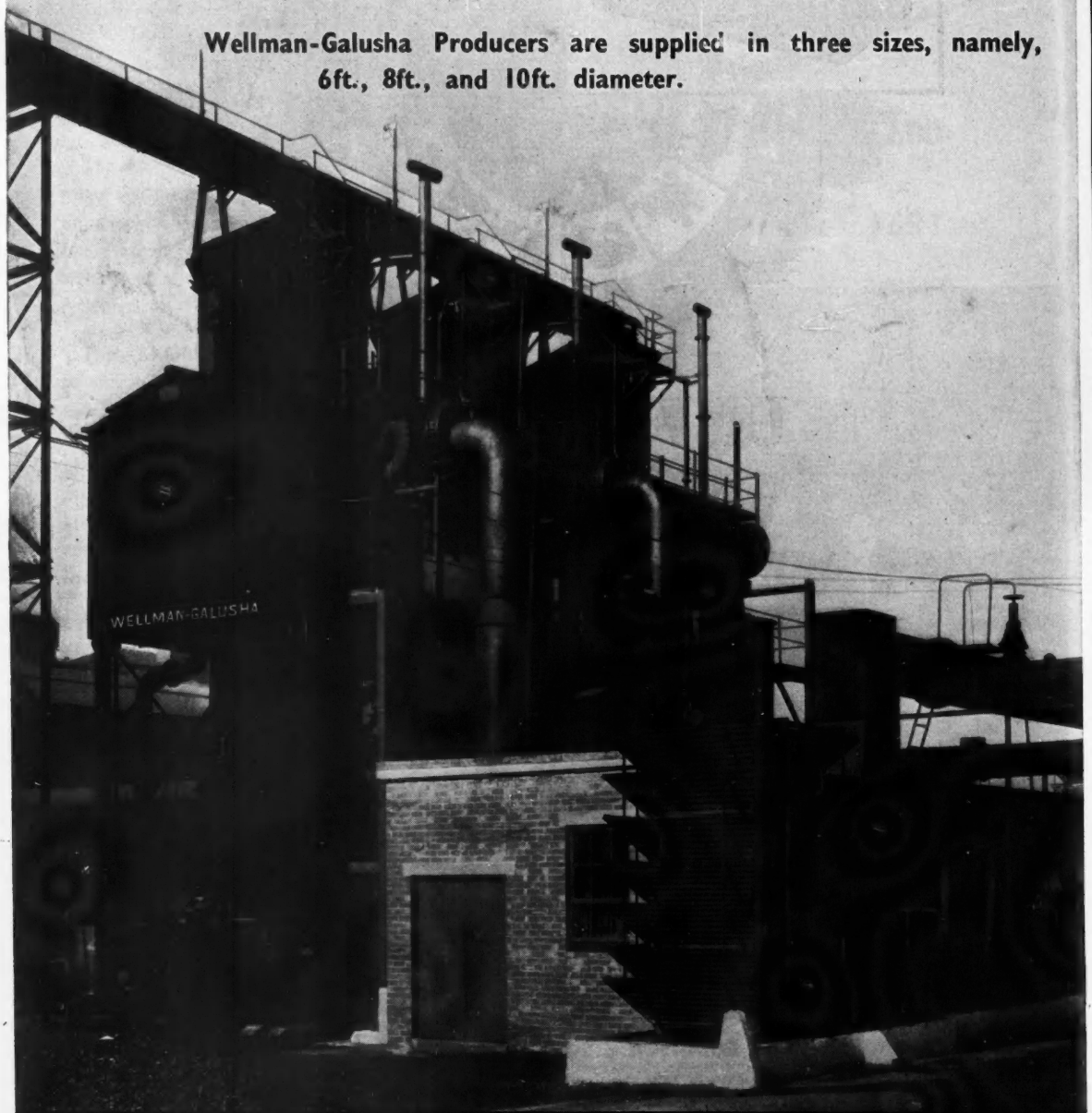
Wellman-Galusha Gas Producers

generate

High Quality Gas from Low Grade Fuels

A battery of three 8ft. diameter Wellman-Galusha Gas Producers, equipped with fuel storage bins and Gas Cleaning Plant, for the efficient gasification of anthracite, coke or coke breeze.

Wellman-Galusha Producers are supplied in three sizes, namely, 6ft., 8ft., and 10ft. diameter.



THE WELLMAN SMITH OWEN ENGINEERING CORPN. LTD.
PARNELL HOUSE, WILTON ROAD, LONDON, S.W.1 WORKS: DARLASTON, SOUTH STAFFS.

BEET SUGAR FACTORY, CANTLEY

Elevated Roadway and Silos
Consulting Engineer: W. C. Andrews, O.B.E., M.I.C.E., M.I.Struct.E.

In addition to the one featured above, several of the installations at The British Sugar Corporation's Cantley Works are founded on FRANKIPILES

The Franki Compressed Pile Company Limited

(FRANKIPILE)

39 Victoria Street, London, S.W.1

WINGS DAY SEPT 20th Give for those who Gave

Phones: ABBey 6006-9 'Grams: Frankipile, Sowest, London

And in Australia, British West Indies, New Zealand & South Africa

Have you specified

VI-TERNUS

Chemical-Fume Resistant PAINT

FUME-PROOF

PERMANENT

RETAINS COLOUR

ECONOMICAL

Vi-ternus Chemical-Fume Resistant Paint was specially formulated to meet the demand for a material capable of withstanding the penetrating effects of chemical, acid and other fumes, which rot and discolour Gasholders and other Plant. Tests carried out by one of the large Gas Concerns, using a plate coated with Vi-ternus C.R. Paints, suspended over an open bath of ammonia, showed that the Vi-ternus finish was not in the least affected.

This material is at present produced in one colour only, that of Bright Foliage Green, as this colour has proved to be the only shade capable of resisting the fumes, whilst still retaining its colour.

You are invited to place a trial order of say 1 gallon, try it out on the most fume-ridden section of your plant, subject it to the most rigorous tests, and so prove to yourself that Vi-ternus C.R. Paint is everything it is claimed to be.

MANUFACTURED BY

John E. Williams & Co Ltd

Makers of Superfine Paints since 1846

Technical Representative to the Gas Industry:

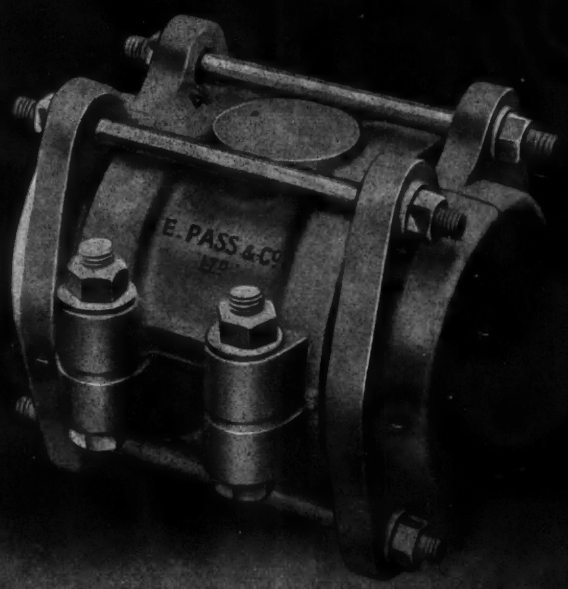
Mr W. E. Settle,
66 Bridgwater Road, Bradford, Yorks.

PARTINGTON - MANCHESTER

GLANDED

SPLIT

COLLARS



FOR REPAIR AND SERVICE WORK

TELEPHONE DENTON 3001/2/3

E. PASS & CO. LTD

GAS & WATER ENGINEERS DENTON LANCS.

TELEGRAMS TOOLS DENTON LANCS

FORWARD DRIVE...

Good Service and good Returns; a minimum of Faults in a long protracted game. And from the distant Base Line of 1847 the Forward Drive has been, and remains, the outstanding feature.

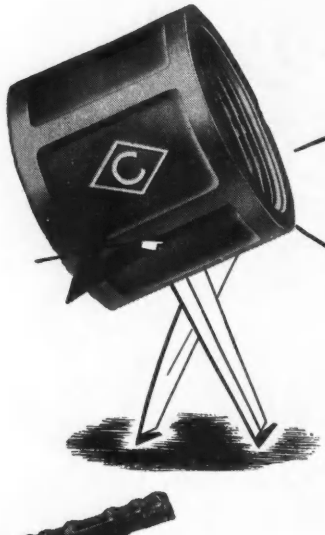
A GREAT NAME IN A GREAT INDUSTRY

Drakes
LIMITED · HALIFAX · YORKS

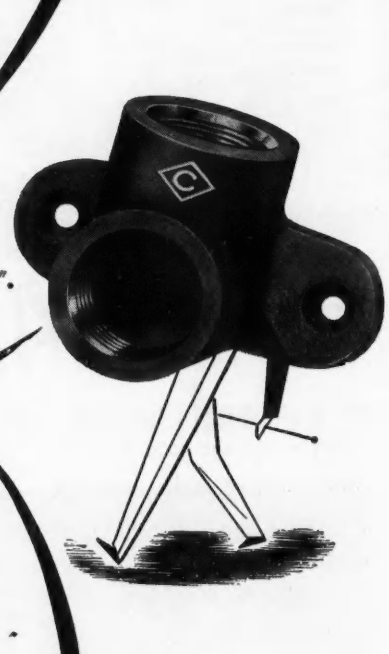
Telephone: Halifax 4701 PB. Ex. Telegrams: Draketed, Halifax

CONSTRUCTIONAL GAS ENGINEERS FOR MORE THAN A CENTURY

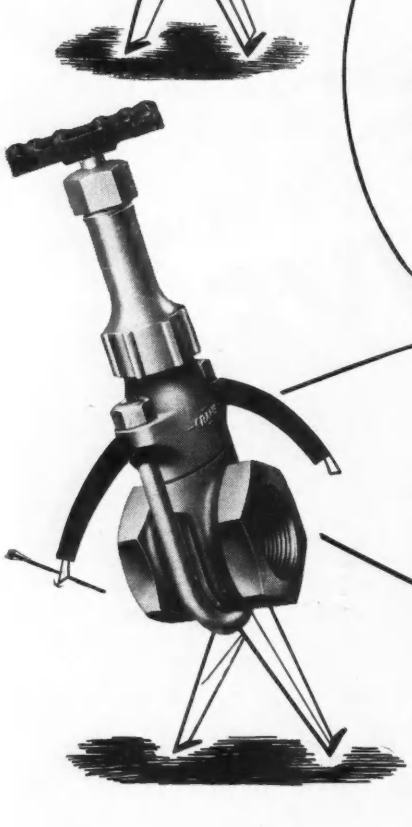
CRANE ON PARADE



Crane Malleable Iron Banded Socket—Sizes: (equal and reducing) ¼"—6". Black and Galvanised.



Crane Malleable Iron Strapped Drop Elbow. Sizes: ¼"—1¼". Black and Galvanised.



Crane Cast Iron Clamp Gate Valve. Wedge disc—rising stem. All Iron or Gun Metal trim. Screwed ends, ½" to 4" and flanged ends 1" to 4".

Just three items selected from the Crane lists, which give details of Malleable Iron Plain and Banded Pipe Fittings for all purposes. Made to British Standard Dimensions—individually tested—taper threads. Also a wide range of Cast Iron and Gun Metal Valves.

CRANE VALVES AND FITTINGS

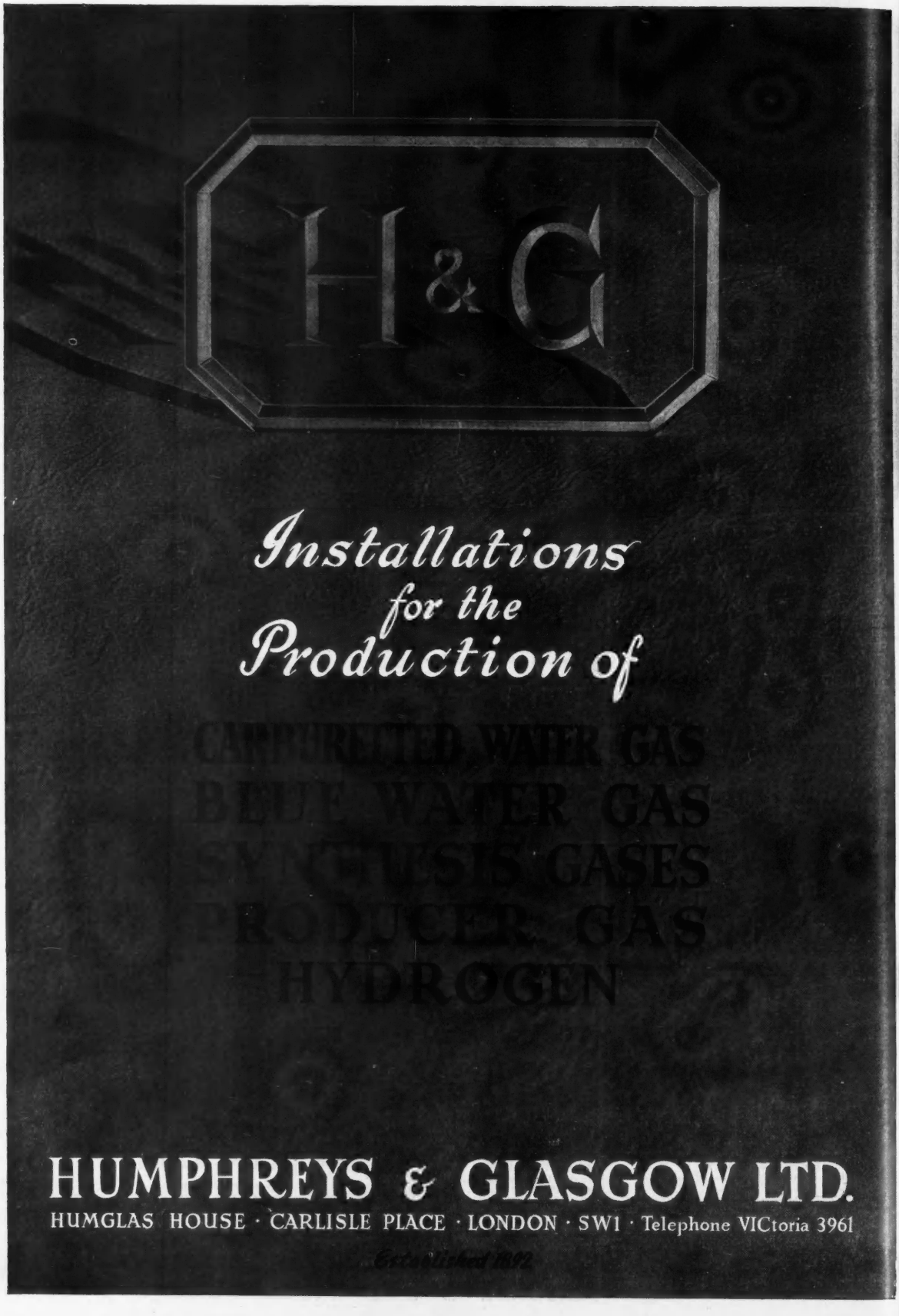
AF15

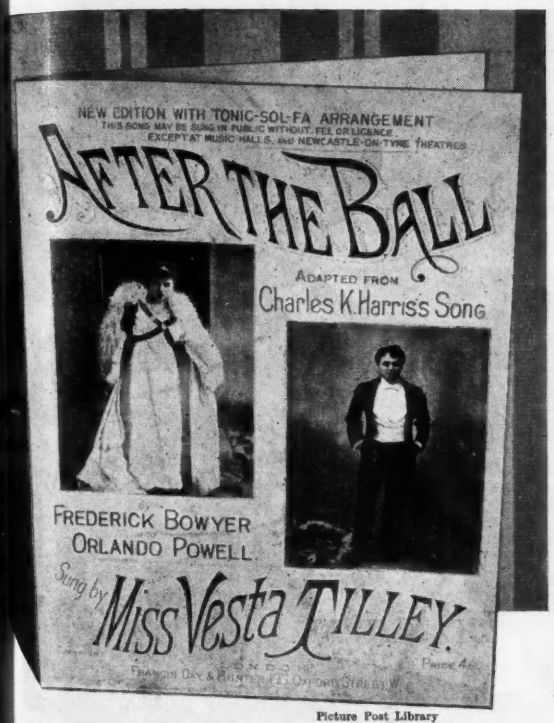
CRANE LTD., 45—51, LEMAN STREET, LONDON, E.1. WORKS: IPSWICH

BRANCHES: BIRMINGHAM BRENTFORD, BRISTOL, GLASGOW, MANCHESTER

INDEX TO 'JOURNAL' ADVERTISERS

	PAGE
A	
A.C.E. Machinery, Ltd.	
Abbott, Birks & Co., Ltd.	435
Accurate Recording Instrument Co.	
Acme Wringers, Ltd.	
Aerogen Co., Ltd.	
Aerograph Co., Ltd.	
Alder & Mackay, Ltd.	S2
Allan Taylor (Engineers) Ltd.	
Armco, Ltd., (Bundy Tubing Division)	
Ascot Gas Water Heaters, Ltd.	
Ascot Gas Water Heaters, Ltd. (F.A. Neat)	
Ashmore, Benson, Pease & Co.	
Ashworth & Parker, Ltd.	
Aspinall's (Paints), Ltd.	
Associated Lead Manufacturers, Ltd.	
Associated Lead Manufacturers, Ltd. (Rustodian)	
Automatic Telephone & Electric Co., Ltd.	
Automotive Products, Ltd.	
Averill, C. R., Ltd.	438
B	
Bailey, Sir W. H., & Co., Ltd.	
Bale & Church, Ltd.	S3
Balfour, Henry, & Co., Ltd.	
Begwaco Meters, Ltd.	
Bell's Asbestos & Engineering, Ltd.	
Benham & Sons, Ltd.	
Blakeley, Firth, Sons & Co., Ltd.	430
Booth, John & Sons (Bolton), Ltd.	
Boydell, E., & Co., Ltd.	
Bratt Colbran, Ltd.	
Bray, George, & Co., Ltd.	
Bray, W. E., & Co., Ltd.	
Bright, Son & Co. (Clerkenwell), Ltd.	
Bristol's Instrument Co., Ltd.	
British Flint & Cerium Manufacturers, Ltd.	
British, Foreign & Colonial Automatic Light Controlling Co., Ltd.	
British Furnaces, Ltd.	
British Gas Purifying Materials Co.	
British Industrial Products	
British Iron & Steel Federation	480
British Oxygen Co., Ltd.	
British Rototherm Co., Ltd.	
British Thermostat Co., Ltd.	
British Thomson Houston, Ltd.	
British Tyre and Rubber Co., Ltd.	
British Vacuum Cleaner & Engineering Co., Ltd.	
Broadbent, Thomas, & Sons, Ltd.	
Brockhouse Heater Co., Ltd.	
Broom & Wade, Ltd.	
Brotherhood, Peter, Ltd.	
Brown, J., & Co., Ltd.	
Bugden, Thos., & Co.	
C	
Cambridge Instrument Co., Ltd.	
Cannon (Holdings) Ltd.	
Carron Co.	
Cementation Co., Ltd.	428
Central Manufacturing & Trading Co. (Dudley) Ltd.	
Chemical Engineering Wiltons Ltd.	
Chemical & Insulating Co., Ltd.	
Cinema-Television, Ltd.	
Clapham Bros., Ltd.	
Clayton, Son & Co., Ltd.	
Clifford Engineering Co., Ltd.	
Cochran & Co., Annan, Ltd.	
Cohen, George, Sons & Co., Ltd.	443, 455
Collins, Thomas, & Co., Ltd.	
Concrete Proofing Co., Ltd.	480
Consolidated Pneumatic Tool Co., Ltd.	
Coventry Chromium Plating Co. Ltd.	
Cowper Penfold & Co., Ltd.	
Cox & Danks, Ltd.	
Crane, Ltd.	452
Crone & Taylor, Ltd.	
Crosby & Co., Ltd.	
Crosslands (Rugeley) Ltd.	
Crossley Bros.	
Curtis, A. L., & Co.	
Cutler, Samuel, & Sons, Ltd.	
D	
Dale Reynolds & Co., Ltd.	
Davey, Paxman & Co., Ltd.	S1
De la Rue, Thomas, & Co., Ltd. (Potterton Gas Group)	
Demolition & Construction Co. Ltd.	
Dempster, R. & J., Ltd.	
Dempster, Robert, & Sons, Ltd.	Cover I
Derbyshire Silica Firebrick Co., Ltd.	
Dexion Ltd.	
Diaphragm & General Leather Co., Ltd.	
Dick, R. & J., Ltd.	
Donkin (The Bryan) Co., Ltd.	Cover II
Douglas, Robert M., (Contractors), Ltd.	
Douglas, William, & Sons, Ltd.	
Drakes, Ltd.	451
Drew, H. B., Ltd.	
Dunlop & Ranken, Ltd.	
E	
E.B. Refractory Cement Co., Ltd.	
Edgar, William, & Son, Ltd.	
Elcontrol Ltd.	
Electroflo Meters Co., Ltd.	
Electrolux Ltd.	
Elliott Bros. (London), Ltd.	432
English Electric Co., Ltd.	
Ether, Ltd.	
Eversbed & Vignoles, Ltd.	
Evode Ltd.	
Ewart Chainbelt Co., Ltd.	
Ewart & Sons, Ltd.	
Expanded Metal Co., Ltd.	
F	
Falk Stadelmann & Co., Ltd.	
Fibreglass, Ltd.	
Flavel, S., & Co., Ltd.	474
Fluxite, Ltd.	
Four Oaks Spraying Machine Co., Ltd.	
Fowler, John & Co., (Leeds) Ltd.	428
Franki Compressed Pile Co., Ltd.	449
Fraser & Chalmers, Engineering Works	
Fry's Metal Foundries, Ltd.	
Fyffe & Co., Ltd.	
G	
Gas Chambers & Coke Ovens, Ltd.	433
Gas Purification & Chemical, Ltd.	S3
General Descaling Co., Ltd.	
General Electric Co. Ltd.,	
General Gas Appliances, Ltd.	439
Gibbons Bros., Ltd.	
Gibbons (Dudley), Ltd.	
Gibson, John & Son, Ltd.	
Glover, (George, & Co., Ltd.	425
Glover, Thomas, & Co., Ltd.	456
Godfrey Sir George, & Partners (Industrial) Ltd.	
Goodall Clayton & Co., Ltd.	
Goodyear Mechanical Goods	
Grant & West, Ltd.	
Graphite Products, Ltd.	
Green E., & Son, Ltd.	
Green & Boulding, Ltd.	S4
Gunite Construction Co., Ltd.	444
H	
Hamilton, A. H., & Co., Ltd.	430
Hardman & Holden, Ltd.	434
Harris & Pearson, Ltd.	
Harris Engineering Co., Ltd.	
Harrisons (London), Ltd.	
Harvey, G. A., & Co. (London), Ltd.	
Hawkins, W. T. & Co.	
Heaths (Eccles), Ltd.	
Hewitt Construction Co., Ltd.	
Hickson's Timber Impregnation Co. (G.B.), Ltd.	
Hilmor, Ltd.	
Holden & Brooke, Ltd.	
Holmes, W. C., & Co., Ltd.	S5
Honeywell-Brown, Ltd.	
Horseley Bridge & Thomas Piggott, Ltd.	441
Horstmann Gear Co., Ltd.	
Howden, James, & Co., Ltd.	
Hughes, F. A. & Co., Ltd.	
Humphreys & Glasgow, Ltd.	454
I	
Ideal Boilers & Radiators, Ltd.	
I.C.I. Ltd. (Metals Division)	
Ingham, John, & Sons, Ltd.	436
International Combustion, Ltd.	
J	
Jeavons, E. E., & Co., Ltd.	
Jeavons Engineering Co.	425
Jenkins, W. J., & Co., Ltd.	
Johnson, C. H. (Machinery) Ltd.	
K	
Keay, E. C. & J., Ltd	
Keith Blackman, Ltd.	S6
Kerr, John & Co., (M/C) Ltd.	
King, Geo. W Ltd.	
King, Walter, Ltd.	444, S3
Kings Patent Agency, Ltd.	
Kirk & Co. (Tubes), Ltd.	
Kirkham Hulett & Chandler, Ltd.	
Kleenoff Co.	
Klinger, Richard, Ltd.	
L	
Laidlaw, R., & Son (Edin.), Ltd.	S6
Lamont, James H., & Co., Ltd.	
Lancashire Dynamo & Crypto, Ltd.	
Lawler, Ayers & Co., Ltd.	
Le Bas Tube Co., Ltd.	
Leeds X.L. Fire Cement Co.	
Lionweld, Ltd.	
Lind, Peter, Ltd.	
M	
Macpherson, Donald, & Co., Ltd.	
Magnetic Valve Co., Ltd.	
Main, R. & A., Ltd.	478, 479
Marco Conveyor & Engineering Co., Ltd.	
Master Gas Cookers Ltd.	
Mavor & Coulson, Ltd.	
Mechanical Handling	
Meltham Silica Fire Brick Co., Ltd.	
Mercol Products, Ltd.	
Messenger & Sons, Ltd.	S1
Meters, Ltd.	
Metropolitan Leather Co., Ltd.	
Milnes Meters, Ltd.	
Mitcham Smelters Ltd.	444
Mitchell, H., & Co.	
Moler Products, Ltd.	
Monk, A., & Co., Ltd.	
Morris Commercial Cars, Ltd.	
N	
National Benzole Co., Ltd.	
National Enamels, Ltd.	
Newton Chambers & Co., Ltd.	
Nu-Swift Ltd.	S3
O	
Olding, Jack & Co., Ltd.	
Orme, Evans & Co., Ltd.	
Oxley Engineering Co., Ltd.	
P	
Parkinson & Cowan (Gas Meters), Ltd.	426, 427, 456
Parkinson Stove Co., Ltd.	
Pass, E. & Co., Ltd	450
Peckett & Sons, Ltd.	
Peebles & Co., Ltd	442
Peel, H. Ltd.,	
Pegson, Ltd.	
Perl Controls, Ltd.	
Plus Gas Co., Ltd.	
Power Gas Corporation, Ltd.	
Power Jacks Ltd.	
Powers-Samas Accounting Machines (Sales), Ltd.	
Pratt Engineering Co.,	
Press, William, & Son, Ltd.	431
Pulsometer Engineering Co., Ltd.	
R	
Radiant Heating, Ltd.	
Radiation, Ltd.	472, 473
Rawlplug Co., Ltd.	
Reavell & Co., Ltd.	444
Riley, A. J., & Son, Ltd.	436
Roberts, R. E. & Sons, Ltd.	
Robinson, J. H. & Co., (Liverpool) Ltd.	447
Royles, Ltd.	
Rozalex, Ltd.	
Russell, R., & Sons, Ltd.	430
S	
Salter, T. E., Ltd.	
Saunders Valve Co. Ltd.	
Scottish Non-Ferrous Tube Industries, Ltd.	
Shannon Ltd.	
Siebe Gorman & Co., Ltd.	
Sigma Instrument Co., Ltd.	445
Simon-Carves, Ltd.	429
Simon, Richard, & Sons, Ltd.	
Sisson, W., & Co., Ltd.	438
Slingsby, W., & Co., Ltd.	
Smith Meters, Ltd.	437
Smith, Thos. & Sons, (Rodley), Ltd.	
Spencer, Peter & Sons Ltd.	
Spencer Bonecourt, Ltd.	
Sperryn & Co. Ltd.	
Standard Furnace & Setting Co., Ltd.	
Stanton Ironwork Co., Ltd.	
Staveley Iron & Chemical Co., Ltd.	
Stein, John G., & Co., Ltd.	
Stelcon (Industrial Floors) Ltd.	
Stewart & Gray, Ltd.	
Stewarts & Lloyds, Ltd.	
Stone, J. B., & Co, Ltd.	
Stoves, Ltd.	
Strachan & Henshaw, Ltd.	S2
Stringer Bros.	
Sugg, William, & Co., Ltd.	
Summerson, Thos. & Sons, Ltd.	
Sutcliffe Speakman & Co., Ltd.	
Sutherland, A. G., Ltd.	
T	
Taylor, F., & Sons, Ltd.	
Thomas & Bishop, Ltd.	
Thomas (Richard) & Baldwins, Ltd.	
Thompson, John, Conveyor Co.	
Thorp, Thomas, & Co., Ltd.	Cover II
Tully, Sons & Co., Ltd.	
Turners Asbestos Cement Co., Ltd.	
U	
Underpressure Engineering Co., Ltd.	
United Kingdom Construction & Engineering Co., Ltd.	
V	
Vale, Thomas, & Sons, Ltd.	
Visco Engineering Co., Ltd.	
Vulcan Stove Co., Ltd.	
W	
W.D. (Sheeters), Ltd.	
Wailes Dove Bitumastic Ltd.	
Wakefield, C. C., & Co., Ltd.	
Wakelin, P. H., Ltd.	
Walker, C. & W., Ltd.	
Walker, Crosweller & Co., Ltd.	446
Waller, George, & Son, Ltd.	
Ward, Thos. W., Ltd.	
Webster H. R. Ltd.	
Wellington Tube Works, Ltd.	
Wellman Smith Owen Engineering Corpn., Ltd.	448
Wessex Industries (Poole) Ltd.	
West's Gas Improvement Co., Ltd.	Cover III
West Hunwick Silica & Firebrick Co., Ltd.	
West's Piling & Construction Co.,	Cover IV
Westwood & Wrights, Ltd.	
Whessoe, Ltd.	
Whitehouse, Wm., & Co., Ltd.	
Whittaker Hall & Co. (1929) Ltd.	444
Wilkes, A. H., & Co., Ltd.	
Willey & Co., Ltd.	
Williams, John E., Ltd.	450
Williamson Cliff, Ltd.	
Wilson, George, Gas Meters, Ltd.	
Winn & Coales, Ltd.	
Woodall-Duckham Vertical Retort & Oven Construction Co. (1920), Ltd.	471
Wood, Hugh, & Co., Ltd.	440
Wright, Alexander, & Co., Ltd.	
Y	
Yorkshire Copper Works, Ltd.	
Appointments Vacant	S4
Appointments Wanted	
Contracts Open	
Educational	
Financial	
Miscellaneous	
Notice	
Patents	
Plant Wanted	S4
Publications	
Repairs	


H&G
Installations
for the
Production of
CARBURETTED WATER GAS
BLUE WATER GAS
SYNTHESIS GASES
PRODUCER GAS
HYDROGEN
HUMPHREYS & GLASGOW LTD.
HUMGLAS HOUSE · CARLISLE PLACE · LONDON · SW1 · Telephone VICtoria 3961
Established 1892



Picture Post Library

Even before
Vesta Tilley
first sang these words
our SCRAP SERVICE
was bringing the house down.
It still is!

THE 600 GROUP OF COMPANIES

GEORGE COHEN

SONS AND COMPANY LIMITED

Experts in Scrap since 1834

BROADWAY CHAMBERS · HAMMERSMITH · LONDON · W.6

Telephone: Riverside 4141 *Telegrams:* Coborn, Telex, London

And at 600 Commercial Road, E.14 · Bidder Street, Canning Town, E.16 · Bath · Belfast · Birmingham · Hebburn-on-Tyne Leeds · Luton · Manchester · Morriston, Swansea · Sheffield

GJ/525/X66

Gas Journal

104th YEAR OF PUBLICATION

EDITOR: NORMAN S. SMITH, B.Sc. (Gas Eng.)

11, BOLT COURT, FLEET ST., LONDON, E.C.4. Telephone: CENtral 2236-7 Telegrams: Gasking, Fleet.

VOL. 271 NO. 4656 AUGUST 27, 1952

CONTENTS

Page

EDITORIAL COMMENT

Sulphur Removal by Catalysis ... 457
Stable Price Prospects ... 457
Lynmouth Disaster ... 458
Heating and Ventilating Research ... 458
Materials Economy in Building ... 459

NEWS OF CURRENT EVENTS

Hodsman Memorial Fund ... 459
Diary ... 459
News in Brief ... 460
Cleaner Food ... 460
Gas Board's Responsibility ... 460
Gas Installation in Restored School ... 460
Trainees Visit Water Heater Works ... 461
Middlesbrough Sports ... 461
Company News ... 461
South Western Section Summer Meeting ... 462
Northampton Polytechnic ... 462
New Canadian Company ... 462
Gas and Coke Trends in the North West ... 462
Northern Prepayment Concession ... 463
Suggs Acquire Cowper Penfold ... 463
Braille Centenary Window Display ... 463
New Coal Process ... 466
Spent Oxide Burning ... 467
A New Flame Trap ... 467
Industrial Drying ... 481

FEATURE ARTICLE

Sea-borne Coal No. 2: North Thames. From Tyne to London River. By G. W. Battison ... 464

TECHNICAL RECORD

Alternative Methods of Gas Production. By J. E. Davis, M.Inst.Gas E., F.R.I.C., Chief Technical Officer, South Eastern Gas Board ... 468
Catalytic Oxidation of Organic Sulphur Compounds in Coal Gas. By R. H. Griffith, Ph.D., Director, London Research Station, Gas Council, and Controller of Research, North Thames Gas Board ... 475

TRADE NEWS

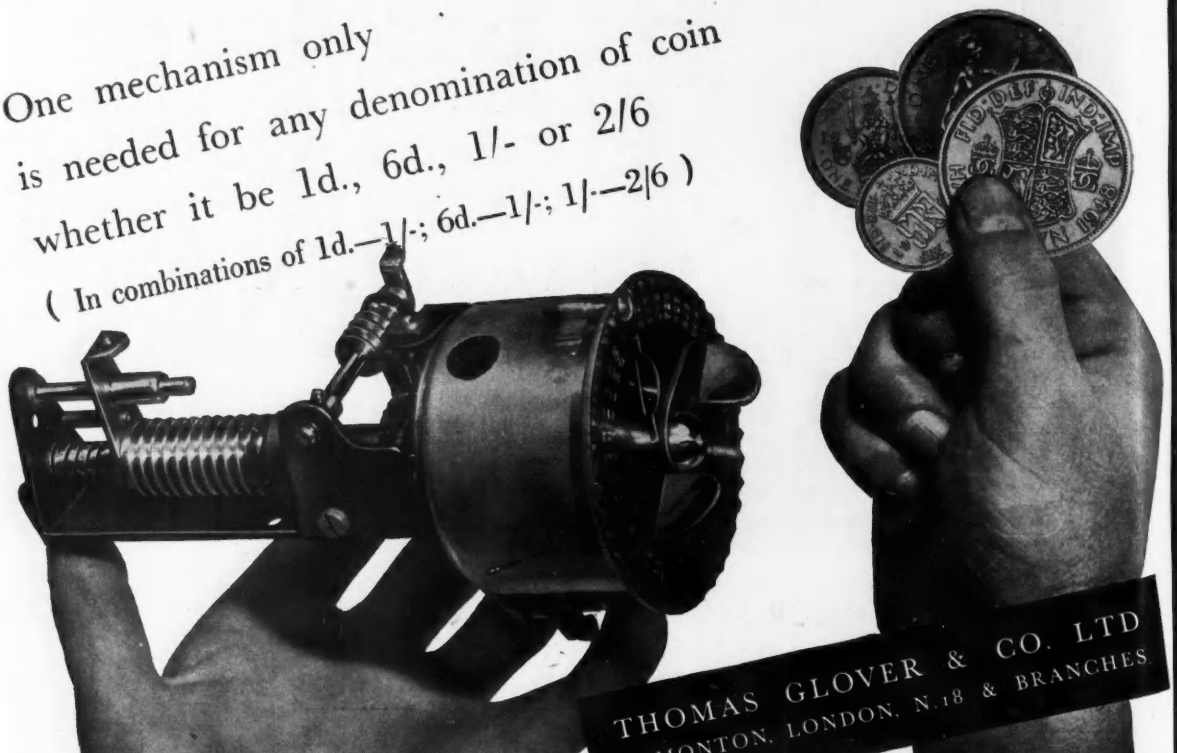
James Stott & Co., Ltd.; Chaseside Engineering Co., Ltd.; W. H. A. Robertson & Co., Ltd.; Thomas Summerson & Co., Ltd.; Elcontrol, Ltd.; Automotive Products, Ltd.; Siebe, Gorman & Co., Ltd. ... 482

Subscription Rates: Home and Empire 52/-; Foreign 60/-

Full Publishers' Notice: See Page S3,

Gas Journal . . . . Walter King Ltd.

One mechanism only
is needed for any denomination of coin
whether it be 1d., 6d., 1/- or 2/6
(In combinations of 1d.—1/-; 6d.—1/-; 1/-—2/6)



Parkinson and Cowan
(GAS METERS) LTD.
★ TERMINAL HOUSE, GROSVENOR GARDENS, LONDON, S.W.1.

- DOMESTIC METERS
- INDUSTRIAL METERS
- INFRA-RED DRIERS
- REMOTE INDICATION AND CONTROL EQUIPMENT
- STREET LAMPS
- LABORATORY METERS
- ROTARY METERS

★ THE HOME OF THE DOUBLE CENTURY METER

AP1

GAS JOURNAL

VOL. 271. No. 4656 104TH YEAR AUGUST 27, 1952

SULPHUR REMOVAL BY CATALYSIS

THAT Dr. R. H. Griffith should be invited to address the Golden Jubilee meeting of the American Chemical Society in New York was not only an honour to the author from our friends in the United States; it was also international recognition of the significance of the original and far-reaching work on catalysis carried out over several years prior to and during and since the war by Griffith and his fellow workers at the Fulham Laboratory of the Gas Light and Coke Company, now the research centre of the North Thames Gas Board and the London Research Station of the Gas Council. We are glad to be able to publish the address, which is devoted to the catalytic oxidation of organic sulphur compounds in coal gas, in later pages of our issue today. It is a description, commendably brief and consequently pre-eminently to the point, of the experiments which led to the putting into operation at Harrow in 1938 of a plant rated at 1,500,000 mil. cu.ft. of coal gas per day; and it will be noted that this took place 14 months only after the catalytic oxidation reaction was first observed in the laboratory—evidence of the faith which the Gas Light had in the findings of its remarkable team of research workers. The catalyst employed is supported nickel subsulphide, the special properties of which were explained by Dr. E. V. Evans and H. Stanier in 1924. The author mentions this and he also refers to the fact that the possibility of a catalytic process for the decomposition of organic sulphur compounds was established by Dr. Charles Carpenter as long ago as 1913. An account of this was in fact published in the *Gas Journal* during that year (Vols. 122 and 123). All this development, we would emphasise, was made under private ownership and guidance. The bibliographical list, though short, at the end of the address provides evidence in part of the volume of work carried out under the auspices of the Gas Light and of those who were chiefly engaged in the investigations.

Dr. Griffith started his address by pointing to the advantages of town gas containing low concentrations of sulphur compounds—as example, increase in the scope for flueless heating appliances, reduction in the cost of maintenance of water heaters. In many industrial processes gas with a very low sulphur content is not merely desirable but essential. Sulphur-removal research, however, has outstripped application, and over the years recommendations of august and highly informed committees have been politely acknowledged and equally politely set aside. Since at an annual meeting of the Institution of Gas Engineers several years ago Dr. Harold Hartley raised the cry 'Sulphur must go!,' the sulphur-removal application story has not been a proud one. The 1939-45 war was, of course, a barrier to progress. But all too little happened in the 10 years and more preceding it. It is good to know that plans have now been completed for a new plant having 10 times the capacity of that at Harrow, and it is good, too, to note the progress which is being made in the installation of small-scale sulphur removal units for use on consumers' premises where low sulphur gas is not available—which means in the vast majority of cases. We now have the re-armament programme, and it is difficult to determine what measure of priority is being given to the supply of gas very low in sulphur content. The fact remains that the claims and advantages of such a supply merit more consideration than the gas industry seems prepared to give it today.

STABLE PRICE PROSPECTS

WILL the third annual reports of the nationalised gas industry—which may be expected before many weeks have passed—show a slowing down, or even a reversal, of the steady expansion in gas sales which has been more or less consistent, with a few abnormal variations during the war period, over a great

many years? Statistics issued by the North Western Gas Board for the 12 months ended June 29 indicate that the expansion which has been proceeding in that area at the rate of about 4½% per annum is not now being maintained. The slowing-down became noticeable in the second half of 1951 and has become more marked since March this year. A similar trend was mentioned at the last meeting of the Eastern Gas Consultative Council. Sales in the Eastern area showed a decrease of 6½% in the June quarter this year compared with the corresponding period in 1951. So far as we are aware no-one has analysed gas sales in any of the areas sufficiently to be able to say whether, or to what relative extent, the falling off is due to milder weather, inability to afford gas at present high prices, or recession in trade. All these have been contributory factors. For the moment we are concerned mainly with price.

In the latest issue of the *Bulletin for Industry* issued by the Information Division of the Treasury there is a forecast that if labour costs remain unchanged there will be a further fall in prices of clothing and other manufactured goods, which may be partly offset by a rise in fares and in electricity charges, which seem to be exceptions to the rule that increases in costs in 1951 have been fully reflected in 1952 selling prices. The *Bulletin* implies that gas prices may be expected to remain stable. It says that coal prices cover existing costs of production, and gas boards have put up prices to take account of the rise in coal and transport prices at the end of last year. This bears out Alderman Turner's statement to the Eastern Consultative Council that the Eastern Gas Board did not at present contemplate making a further increase in gas prices. He gave a warning, however, that the Board's financial position was very finely balanced; that there was no 'cushion' to meet any appreciable rise in costs; and that higher sea-borne coal freights and a pending wage claim might affect costs. Another prerequisite for the maintenance of gas prices at present level is the need for maintained steady sales. It was a coincidence that on the day the *Bulletin* appeared *Picture Post* announced a cut in price from 6d. to 4d. per copy as part of an effort to meet heavy losses. A cut of 33⅓% in gas prices would, of course, be impracticable, but the boards must ever keep in mind the importance of maintaining as low a gas price as possible consistent with sound finance.

In a review of the raw materials supply position the *Bulletin* says shortages are unlikely to check the expected rise in industrial production later this year. The general level of industrial raw materials has risen since mid-1951 and is now at a safe level. Some fall is probable during the rest of the year, but lack of supplies generally should not check the hoped-for increase in production. Coal stocks are better than at any time since the war, and the steel position is such that some increase in the output of engineering goods should be possible in the second half of the year. Production of the major building materials has been higher this year, and stocks at the end of May, apart from cement, were well up on a year earlier. Sulphur imports in the first six months of the year were 12% higher than last year, and output of sulphuric acid has been considerably higher. Altogether the outlook at the end of the holiday season is good, but there is a warning that wage claims which have recently been settled or are now under consideration cover nearly 9 mill. workers, and if all the existing claims are granted in full the reasonable hope of stable prices at home will have to be abandoned.

LYNMOUTH DISASTER

LYNMOUTH, one of Devon's most famous beauty spots, was on the night of August 15 the scene of more devastating floods than any within living memory in that part of the country. Many lives were lost, hotels and houses were wrecked, and whole streets were washed away. Lynmouth as thousands knew it was destroyed overnight, and though some parts may be rebuilt it is certain that it will never be fully restored to its former beauty. The sufferers in the disaster received the practical sympathy of the Queen and countless of her subjects and the nation's sentiments found expression in a £25,000 Government gift following a meeting of the Cabinet five days after the occurrence. Electricity and water supplies were interrupted, but it was rather unfortunate that the B.B.C. and the Press should have given the impression that gas supplies were also involved. In view of the isolated position of Lynton and Lynmouth there is no piped gas within miles of either place, and the inhabitants depend on electricity, solid fuel, and bottled gas for all their heating and cooking requirements. There was, therefore, nothing in which the South Western Gas Board was directly concerned. Indirectly, however, the Board made its contribution to the succour of the victims. At both Minehead and Barnstaple, the two nearest large towns, immediate assistance was offered by the Board in connection with cooking facilities and accommodation.

The position was that many of the visitors took the first opportunity of getting back to their homes, while the inhabitants of Lynton and Lynmouth were reluctant to move very far from the locality. Those people who were evacuated to Minehead and Barnstaple were at first placed in temporary accommodation and later absorbed into hotels and private houses.

HEATING AND VENTILATING RESEARCH

NOT a great deal is known, we think, about the work of the National College for Heating, Ventilating, Refrigeration, and Fan Engineering. Hence the interest which lies in a contribution by the Head of the College, Mr. Neville S. Billington, in the 'Year Book of the Heating and Ventilating Industry,' which has just been issued by Technitrade Journals, Ltd., in collaboration with the Association of Heating, Ventilating, and Domestic Engineering Employers. It will broadly be agreed that, without research, teaching becomes a repetition of 'established' or maybe exploded 'facts.' In the universities, research and teaching to a large extent coalesce. Without the combination lectures would become sterile and tutors dressed-up images of the past; they would become ritual parrots. From the contribution by Mr. Billington we learn that a large part of the teaching work at the National College is now well established, but that it is only within the last year or so that it has been found possible to

make a start with research work, and its organisation has not yet been established. It is anticipated that post-graduate students will take a part in the research at present undertaken by the staff and particularly by the departmental heads, and it is natural that Mr. Billington should put forward a case that industry should be prepared to endow research scholarships tenable at the College. The Institution of Heating and Ventilating Engineers offers such a scholarship and the work of the first scholar has been reported in the *Journal* of the Institution. But Mr. Billington looks to a wider horizon and a more extensive field of research into and teaching of the subjects covered in the curriculum of the College.

MATERIALS ECONOMY IN BUILDING

TOWARDS the end of last year an investigation was begun into the possibilities of increased economy in the use of the main materials employed in this country. The building and works programmes of the main Government departments carrying out works were examined, with the result that the heads of the works directorates of the service departments and the Ministry of Works, under the Chairmanship of Sir Charles Mole, M.V.O., Director General of Works, Ministry of Works, have produced a report entitled 'Economy of Building Materials,' published for the Ministry of Works by the Stationery Office, price 2s. The report is the outcome of a comprehensive examination of problems of materials economy over the whole field covered by the Government works programme, and most of the conclusions reached are of general application, both to building work carried out by Government departments and to that carried out by other authorities and organisations. The four departments who contributed have adopted the report as a code of practice mandatory in their works directorates. The cumulative effect of consistently applying the individual recommendations is expected to produce a substantial contribution to the national effort to save scarce materials.

It is recommended that buildings should be classified according to whether the requirement is permanent or temporary, using an intermediate category where a permanent building is liable to a change of user, and where design should therefore allow for internal alterations to meet changing needs. It is necessary to plan for minimum circulating space in buildings, and floor heights should be no greater than is needed for the particular user. Basement accommodation should be eliminated where possible. Economies can be made in excavation and by replacing, where possible, reinforced concrete for foundations, retaining walls, etc., by mass concrete or brickwork. Importance is attached to the economy that can be made by using pre-stressed concrete for certain applications. The report also specifies certain economies which are possible in the component parts of buildings and in fittings and finishes. Important economies can be made in steelwork by using welded work in place of riveting or bolting. In connection with road formations and heavy structures, saving can be made by using soil stabilisation and also by making use of the findings of soil mechanics. In some cases it is possible to assess an approximate numerical value of the saving estimated to result from using the recommendations. For instance, the recommendation to revert as an interim measure to the war emergency relaxations of the regulations for the electrical equipment of buildings would promote a nationwide economy in copper to the extent of about 20% of that used in internal electric cabling. Again, the use of tough rubber sheathed cable laid direct in the ground for airfield lighting systems, as against the normal practice of using lead sheathed cables, would save, it is estimated, 600 tons of lead a year. Important savings would result from the application of the recommendations in the section of the report on steel economy. For instance, in a three-bay storage shed 120 ft. by 210 ft. long, the use of strip-rolled and tubular designs recommended would show savings of the order of 30% and 40% respectively over the normal bolted and riveted construction. General savings of from 2% to 5% would result in carefully designed semi-rigid construction for multi-storey buildings, and a further small saving would be given by fully rigid framing.

HODSMAN MEMORIAL FUND

At the wish of many of his former students, colleagues, and friends, a fund—to be known as the 'Hodsman Memorial Fund'—has been opened to commemorate the lifetime of service of Mr. Henry James Hodsman, who served Leeds University for 40 years and whose sudden death in January of last year was an occasion for the deepest regret by his wide circle of friends in the gas industry and in the university.

An appeal for donations to the memorial fund has been issued over the signatures of Sir Hubert Houldsworth, Pro-Chancellor of the University and Chairman of the National Coal Board, the Vice-Chancellor, members of the Yorkshire Section of the Society of Chemical Industry (of which Mr. Hodsman was Chairman in 1927-29 and Hon. Secretary and Treasurer for 20 years), and 25 former students and friends.

The appeal recalls the great service Mr. Hodsman rendered to industry, both by choice of research subjects and by regular attendance at meetings of the professional organisations, and is addressed to all who have benefited in the past from his friendship and guidance, and especially to industrial concerns whose technical staffs include former students. We would commend it to any who have been helped by his research achievements and who may have been accidentally omitted from the mailing list.

The intention is to devote the fund to the foundation of travel bursaries for students of Mr. Hodsman's former department and also to present a bound volume of signatures to Mrs. Hodsman. Donations to the fund, which will be duly acknowledged, should be sent to the Hon. Treasurer, Mr. R. Gawler, at Lloyds Bank, Ltd., Woodhouse Lane Branch, Leeds, 2.

Diary

Sept. 2.—East Midlands G.C.C.: Victoria Station Hotel, Nottingham, 11.30 a.m.

Sept 2.—South Eastern G.C.C.: Caxton Hall, Westminster, 2.15 p.m.

Sept. 10.—South Western G.C.C.: 34, Bridge Street, Taunton, 11 a.m.

Sept. 11.—Scottish Association of Gas Managers: Annual General Meeting, Barrfields Pavilion, Largs. (Golf and bowling competitions September 10; Wemyss Bay-Kyles of Bute excursion September 12).

Sept. 15.—Eastern G.C.C.: Connaught Rooms, Kingsway, W.C.2, 2 p.m.

Sept. 15-19.—Association of Public Lighting Engineers: Annual Meeting and Exhibition, Harrogate. Exhibition of public lighting equipment, Gas Council exhibit, Stand No. 9.

Sept. 16.—Irish Association of Gas Managers. Annual Meeting, Londonderry. (For programme see *Journal* of July 30, p. 237.)

Sept. 17.—Wales and Monmouthshire Section, I.G.E.: Third Annual General Meeting, Ruthin.

Sept. 25.—North Thames G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2, 2.30 p.m.

Sept. 26.—Manchester and District Section, I.G.E.: Visit to Robert Dempster and Sons Ltd., Rose Mount Ironworks, Elland, Yorks.

Sept. 29.—West Midlands G.C.C.: Queen's Hotel, Birmingham, 2.30 p.m.

Oct. 1.—Institution of Heating and Ventilating Engineers: 'Industrial Radiant Heating,' F. R. L. White, Vice-President, at the Institution of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m.

News in Brief

The Scottish Gas Board has bought a large building at 5, Hanover Street, Glasgow, and will concentrate there as much of its departments as is practicable. Lack of accommodation has hitherto hampered the full development of the Board's activities. Premises have been scattered over various parts of Glasgow, and it has been necessary to leave certain of the Board's functions, such as the collection of accounts, in the hands of the pre-vesting date authority, in this instance the Glasgow Corporation.

A Course of Lectures on domestic and industrial fuel has been arranged by the Sir John Cass College during the 1952-53 session. While largely intended for those who are interested in the sale and distribution of coal, certain of the lectures will be of interest to gas industry students—*e.g.*, those on carbonisation and gasification, sampling and analysis of coal and coke, combustion, and boiler house instruments. Full particulars of this and other courses may be obtained from the College at Jewry Street, Aldgate, E.C.3.

Ascot Gas Water Heaters, Ltd., announce that, with effect from September 1 their Manchester service depôt will close at 51, King Street and re-open at 70, High Street, Chorlton-on-Medlock, Manchester 13. (Tel.: Rusholme 3358.) This depôt provides service facilities in the areas covered by the Northern, North Western, and North Eastern Gas Boards. The company also announces changes in telephone numbers of their depôts at Oxford and Stoke-on-Trent. The new numbers are Oxford 2924 and Stoke-on-Trent: Longton 33395.

Irish Coal Imports.—Figures issued by the Central Statistics Office in the Republic of Ireland for June, 1952, show imports of 21,711 tons of gas coal, valued at £134,067. This brings the total of these imports for the first six months of 1952 to 143,735 tons, valued at £884,414.

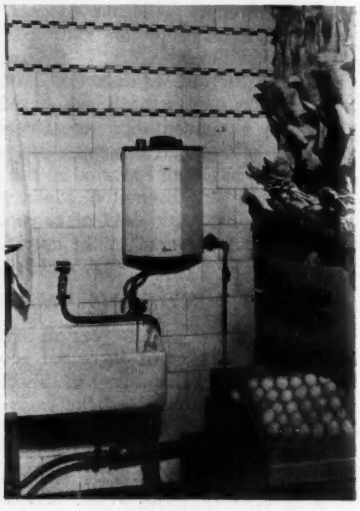
Three Publications just issued by the City and Guilds of London Institute, Department of Technology, 31, Brechin Place, S.W.7, are the annual report for 1951, the examination results for the same year, and the regulations and syllabuses for examinations in chemical, metallurgical, and allied subjects for the 1952-53 session.

Gas Board's Responsibility

THE early editions of the *Daily Express* on August 20 reported the coroner's comments at an inquest on a gas poisoning fatality at Leeds. It was stated that, following a complaint, a gas inspector found a fracture in a lead pipe and notified the landlord. On the instructions of the landlord a plumber went to the house and mended a leak, but it was not the one in the victim's room.

A North Eastern Gas Board official said that the Board had no power to enter premises to see that the repair had been carried out. The coroner, in recording a verdict of accidental death, said that he did not consider that the Gas Board's responsibility should end with the notification of the landlord. An inspector should make a further visit.

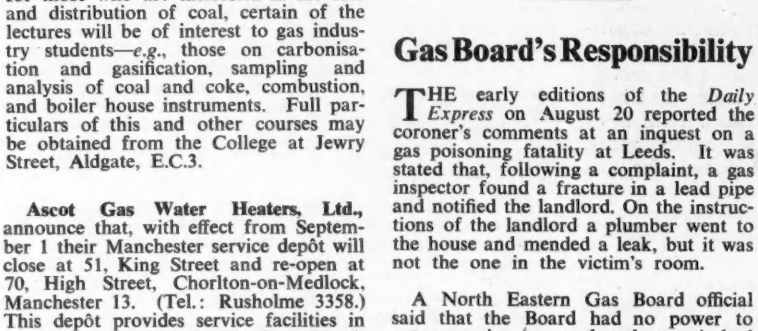
CLEANER FOOD



One of the oldest markets in the country has responded to the call for clean food. Some 122 food stalls in Grainger Market, Newcastle-on-Tyne, are being fitted with Newlyn sink water heaters by the Newcastle gas undertaking. Grainger Market, owned by the Corporation, dates back to 1835, and is reputed to be the largest covered market in the country. It has 185 separate stalls, all housed under a giant glass arch.

Change of Address.—The British Wood Preserving Association has now moved to 6, Southampton Place, London, W.C.2. Tel.: Chancery 4347-8.

GAS INSTALLATION IN RESTORED SCHOOL



General view of the school kitchen, showing in the foreground the four Falkirk boiling pans.

THE Wykeham School, Aboyne Road, Willesden, has recently been restored at a cost of approximately £65,000, after being badly bombed during the war. This school, which accommodates 1,000 pupils, is managed by the Willesden Education Committee of the Middlesex County Council. The architect in charge of the restoration and modernisation was Mr. G. F. Rowe, A.R.I.B.A., in co-operation with the Willesden Borough Engineer, Mr. John C. Morris, B.SC.

The school kitchen, which is designed to serve 750 mid-day meals, has been equipped with a comprehensive gas installation by the North Thames Gas Board.

The two dining rooms (together having a seating capacity of 360) and the servery are above the kitchens. The following is the gas equipment:

Kitchen: Three Newton Chambers steaming ovens; four Falkirk boiling pans; six Vulcan general purpose ovens; one Vulcan single-oven cooker; and one black and white sterilising sink.

Servery and Wash Up: Two 2-tier Falkirk hot closets, and two black and white sterilising sinks. Hot water is provided by a Potterton D.6 Rex Boiler.

TRAINEES VISIT WATER HEATER WORKS

EWART & SON, LTD., water heater manufacturers, Letchworth, threw open their factory on August 13 to a group of North Thames Gas Board trainees from Watson House.

A coach conveyed them from London to the factory where they were met and personally welcomed by Mr. Bernard H. Wallis, Managing Director, and Mr. G. Ewart, Sales Director. They were escorted over the factory by Mr. Valentine, Works Manager, and Mr. Gray, Works Superintendent, and shown the complete range of water heaters in production, special interest being roused by the machinery designed for tube bending and shaping the fire boxes for the M.75 sink heater.

At the conclusion of the tour, which included the foundry and the spinning shop and sections of the machine shop where tracer shells for the re-armament programme were being manufactured, lunch was arranged in the senior staff canteen.

Afterwards, Mr. Blum, Chief Designer, and his assistant, Mr. Brickwood, gave an interesting lecture covering the standard range of domestic water heaters. Installation and servicing details were given with particular emphasis on installation and ease of after-sales service. At the conclusion of the lecture tea was served and the party departed for London having spent a thoroughly enjoyable and instructive day.

Middlesbrough Sports

THE second annual sports meeting of the Middlesbrough division of the Northern Gas Board was held on the Redcar Race Course on August 16. This meeting is organised entirely by representatives of the staff and workpeople from the various sports clubs attached to each unit of the Middlesbrough division. It is the only event of its kind held in the area of the Northern Gas Board.

About 450 employees and their wives and children attended the meeting which consisted of athletic field events of all kinds, the number of events being 33. Tea and refreshments were provided and the catering was carried out by employees of the division.

The prizes were presented by Mr. J. R. Bradshaw, Deputy Chairman of the Northern Gas Board, and Mrs. Bradshaw. Also present were Mr. J. W. Pallister, Divisional General Manager, and Mrs. Pallister; Mr. L. A. Garratt, Industrial Relations Officer; Mr. S. Jones, Engineer and Manager of the Western section; Mr. H. P. Allison, Engineer and Manager of the Eastern section, and Mrs. Allison; Mr. A. R. Croft, Group Manager of the Cumberland group and Mrs. Croft; Mr. J. R. Cleator, Manager of the South Bank unit; Mr. W. R. Jessop, Manager of the Cleveland unit, and Mrs. Jessop; and Councillor G. F. Andrew, a member of the Consumer Committee.

The 'Pallister' Cup, awarded annually to the unit winning the largest number of points in the field events, was won by the Middlesbrough unit and presented by Mr. Bradshaw to Mr. Jones, Engineer and Manager, at the close of the meeting.

Company News

CORK

An interim dividend at the rate of 3% for the year ending December 31, 1952, has been declared by the Directors of the Cork Gas Consumers' Company, payable on August 29.

GEO. W. KING, LTD.

The 15th annual general meeting of Geo. W. King, Ltd., was held on July 28 in London. Major A. C. Herring, V.C., A.C.A. (the Chairman), presided. Trading profit for the year 1951 amounted to £196,970, as compared with £139,819 for 1950; while after providing for Directors' emoluments, depreciation and auditors' remuneration, the balance of profit available was £153,309, as compared with £103,057 for the previous year. The Directors have written off a further sum of £4,576, being special expenses, mainly in connection with the firm's removal to Stevenage, and £8,688 being the expenses relating to the issue of the preference share capital. The Directors recommended an ordinary dividend of 12½% (less income tax), transfer to reserve account £20,000, and to the staff welfare fund £2,500, leaving a balance to be carried forward of £52,674, as compared with the amount of £34,277 brought in.

At an extraordinary general meeting which followed, a resolution was approved for capitalising the sum of £40,000, being £20,296 post-war refund of excess profits tax and £19,704 from the amount standing to the credit of ordinary share premium account, this sum to be applied in paying up in full 160,000 ordinary shares of 5s. each of the Company.

B.D.H. ENGINEERS

The fourth annual general meeting of B.H.D. Engineers, Ltd., was held on August 21 at the Grosvenor Hotel, London, S.W.1, Mr. D. M. Henshaw, M.Inst.Gas E. (the Chairman), presiding.

In the course of his statement the Chairman said: The profit for the group is £383,927 as against £278,200 in the year to March 31, 1951, an increase of £105,727. The taxation charge is £236,775 compared with £156,082 last year and, after providing for the interest of outside shareholders in the subsidiary companies, the net profit available for distribution amounts to £140,420 as against £116,706.

In view of the satisfactory results, the Directors of the Company have decided that this year a bonus of 2½% is justified in addition to the usual final dividend of 10%. The dividends and bonus for the year absorb £33,313, and there remains a sum of £111,896 to be added to reserve and carry-forward. The total of the capital and reserves has increased from £851,622 to £965,873. This increase has been almost completely absorbed in fixed assets which have risen from £369,799 to £461,508. and these substantial additions to buildings and plant have been made with a negligible increase in the bank overdraft.

The growth of business in the Holset department of Messrs. W. C. Holmes & Co., Ltd., for which increased buildings and equipment are required has, since the year end, made it desirable to form the Holset Engineering Co., Ltd., as a separate wholly-owned subsidiary.

SOUTH WESTERN SECTION SUMMER MEETING

THE summer meeting and ladies' day of the South Western Section of the Institution of Gas Engineers, was held on July 16 at Barnstaple, headquarters of the North Devon Sub-Division, South Western Gas Board, of which Mr. J. H. Lowther, Chairman of the Section and formerly Engineer and Managing Director of the Barnstaple Gas Company, is Sub-Divisional Manager.

Visitors at Barnstaple Gasworks. Left to right: S. B. Jones, Production Engineer, North Devon Sub-Division; A. Robertshaw; J. H. Lowther, Chairman of the South Western Section of the Institution of Gas Engineers; G. E. Currier, President of the Institution; and A. E. Williams, Station Engineer at Barnstaple.

In spite of forecasts of rain over south western England, the meeting was blessed with brilliant weather. Members spent part of the morning touring the Barnstaple works while their ladies foregathered at Bromley's Café for coffee and about noon the whole party took coach for Ilfracombe where they had lunch at the Dilkhusa Grand Hotel at the invitation of the South Western Gas Board.

It was the Chairman's wish that there should be no speeches as such, but he was able to persuade the President of the Institution (Mr. G. E. Currier), Mr. C. H. Chester, the host of the luncheon, and Mr. W. H. Bennett, the Section's only 'honorary' visitor, who, as Chairman of Associated Gas and Water Undertakings, Ltd., was closely associated for many years with the former Barnstaple Gas Company, to say a few words.

In the afternoon the party left for Blackmore Gate, Simonsbath, Exeford, Dunkery Beacon (where a brief halt was made so that members could appreciate the panorama unfolded below them), Horner and Dunster, where tea was waiting. The return trip to Barnstaple was through the Exe Valley and South Molton.

Northampton Polytechnic

THE 1952-53 prospectus of part-time courses in pure and applied chemistry just issued by the Northampton Polytechnic is indicative of the wide and growing scope of this centre, which forms part of the public system of technical education for which the London County Council in association with the Ministry of Education is responsible. The Northampton Polytechnic is approved by the Royal Institute of Chemistry for the preparation of candidates for the A.R.I.C. examination. Courses are arranged to this end, and there are other courses covering metallurgy, fuel technology, and chemical engineering.

Among special evening lectures for the coming session is a course on 'Refractories: Their Manufacture, Properties, and Uses.' This course of weekly lectures starts on September 30 and closes on December 16.

New Canadian Company

MR. W. LINDSAY BURNS, Chairman and Managing Director of the Balfour Group of Companies, has returned from Canada and the United States, having completed arrangements for the formation of a new Canadian company—British and Dominion Process Engineering, Ltd. Mr. Burns was accompanied by Mr. A. H. Rowles, Managing Director of W. S. Barron & Son, Ltd., of Gloucester. The new company is a branch of Canada Ironfoundries—Dominion Wheel and Foundries, Ltd., and, under the arrangement, the capital structure is so arranged that 50% is Canadian and 50% British: the Balfour Group having 30% of the capital, and W. S. Barron & Son, Ltd., 20%.

Under the ægis of the new Company, Balfour, Scott and Barron will extend their operations in Canada and the United States. Arrangements have been made for two Directors from the British side to be in Canada for a period. The Balfour Group Director will be Mr. H. D. Macmurray, and, on the Barron side, Mr. W. H. Moreland.

GAS AND COKE TRENDS IN THE NORTH WEST

FIGURES which indicate the trend of gas and coke production in the industrial north west during the year ended June 29 have been published by the North Western Gas Board, which supplies gas and coke to 1¼ mill. consumers in Lancashire and Cheshire and parts of four adjoining counties, and is the second largest of the 12 gas boards.

Coal carbonised by the Board during the year was 4,245,000 tons, a 2% advance on the previous year, but the quantity carbonised in June, 1952, at 281,500 tons was 2% down compared with June, 1951. The Board states that its output was running higher than last year up to about the middle of March, 1952, when it began to fall below last year's level.

Total gas available for sale at 81,472 mill. cu.ft., including 2,221 mill. cu.ft. of gas purchased from outside sources, was about 0.7% more than in the previous 12 months. The Board's own output at 79,251 mill. cu.ft. was about 0.5% more than in the previous year.

In June the total available for sale, including 166 mill. cu.ft. bought from outside sources, was 5,292 mill. cu.ft., some 0.2% less than in the same month last year.

It is pointed out that expansion of gas sales which has been proceeding at the rate of about 4½% per annum is not now being maintained. The slowing down became noticeable in the second half of 1951 and has become more marked since March this year.

Coke production available for sale for the year ended June 29, was 1,656,383 tons, representing an increase of 8½% over the previous year's production. June production at 114,456 tons was only 0.8% above June, 1951.

Coke sales for the year at 1,496,471 tons were nearly 13% down compared with the previous year's sales, and June sales were about 30% down compared with sales in June, 1951 This fall in sales is attributed primarily to the recent recession in industrial activity in the north western area of the country.

The Board states that although 2% less coal was carbonised in June this year, as compared with the same month the previous year, output of gas obtained was only 0.4% less, while the yield of coke available for sale was actually 1% more. Similarly, in the year ended June 29, though gas production from 2% more coal was only 0.5% more, coke production available for sale increased by 8½% as compared with the corresponding figures for the previous 12 months.

Northern Prepayment Concession

ADDITIONAL supplementary charges for gas supplied through prepayment meters to consumers whose apparatus was installed by the Northern Gas Board will be confined to a maximum of 2s. 6d. from April 1, 1953. This concession, announced at a meeting of the Northern Gas Consultative Council in Newcastle on August 13, affects prepayment consumers who use free (not hired) gas appliances. They will pay their additional supplementary charge of 1d. per therm for the first 30 therms only.

This concession will cost the Board £30,000 to £35,000 a year, and for this reason it cannot be brought into operation during the current financial year without upsetting present commitments. Alderman Joseph Hoy, Chairman of the Consultative Council, informed members that the concession had been tentatively agreed by the Chairman of the Northern Gas Board (Mr. E. Crowther) and he was confident that the Board would agree to it at its next meeting.

Alderman Hoy recalled that the matter was brought before the Council by the Stockton Division Consumers' Committee which complained that where a consumer had a free appliance he paid the additional supplementary charge of 1d. on every therm used. If, as on one estate in Stockton, a consumer had gas for lighting, in addition to other facilities, he paid the supplement on the gas used for lighting as well as on the gas used by the appliances, which the Committee considered unfair. The charge of 1d. per therm in addition to the existing supplementary charge of 1½d. per therm for all gas up to 30 therms per quarter supplied through the prepayment meters was, he said, a very grave injustice against those prepayment consumers who hired prepayment appliances from the Board on a 'free' basis. The supplementary charge, he added, was a 'dying quantity' because as free appliances were withdrawn the Board was putting out apparatus on simple hire terms.

'Kept in the Dark'

The Council complained that it was being kept in the dark over the reason why the gas industry had to pay more than other industries for its coal. It asked the secretary to write to the secretary of the Industrial Coal Consumers' Council for the formula under which coal prices are fixed. This decision was made after Alderman Hoy had said that in reply to his letter asking for information the Ministry of Fuel and Power stated that in view of the fact that the whole question had been thoroughly investigated by the Industrial Coal Consumers' Council they were not in a position to comply with his request for comment.

In his letter requesting information, Alderman Hoy asked why the National Coal Board thrust upon the gas industry such a heavy financial burden and had shown such marked discrimination against gas consumers. Alderman Hoy asked that before further increases in coal prices took place the gas and electricity industries should be consulted. In their reply, the Ministry pointed out that there were many other important industries, both nationalised and private, which were very large consumers of coal, and to confine such preliminary discussions to the gas and electricity industries might be very difficult.

The Council received a report on a complaint from Egglescliffe Parish Council about charges for maintenance of street lighting. The Parish Council had complained about high charges and had asked whether a fixed weekly rate could not be introduced. The Consultative Council agreed that the Board could not make a concession to one particular local authority.

Worked Examples in Illuminating Engineering (By R. W. Ames and J. B. Harris; Macdonald & Co. (Publishers), Ltd., 16, Maddox Street, W.1; 21s. net) is written particularly for those who are preparing for examinations of the City and Guilds of London Institute, of London University, and of the various professional institutions. It contains much of interest to students, engineers, architects, and all concerned with lighting, for the questions and solutions are not only of academic interest but many are practical, derived from actual experience which will help to solve many similar problems. Moreover, the solutions provided in this book will be of the utmost value in suggesting clarity and conciseness of expression.

Sugg's Acquires Cowper Penfold Shares

THE Directors of William Sugg & Co., Ltd., gas and general engineers, announce that the Company has now acquired the whole of the Preference and Ordinary shares in Cowper Penfold & Co., Ltd., designers and manufacturers of gas appliances. In July, 1951, the Company purchased a substantial share holding in Cowper Penfold & Co., Ltd., and three of its Directors, Messrs. W. T. Mattock, P. C. Sugg, and R. W. Young were appointed Directors of Cowper Penfold.

With this latest acquisition of shares Cowper Penfold will become a wholly-owned subsidiary of William Sugg & Co., Ltd. At the same time Mr. C. Cowper Penfold has been appointed a Director of Sugg's as from July 1, 1952.

The announcement states that the parent Company has purchased 3,450 £1 Preference shares at £1 each and 30,000 1s. 'B' Ordinary shares at 4s. 9d. each, representing a total purchase value of £10,575.

The purchase value has been satisfied by the issue of 4,696 £1 shares in William Sugg & Co., Ltd., at 45s. each, representing a sum of £10,566, plus a sum of £9 in cash. The shares in the parent Company so issued do not rank for dividend payable for the year ended June 30, 1952, but will rank *pari passu* in all other respects with the existing Ordinary shares. Application is being made to the London Stock Exchange for a quotation for these shares. The Directors of the parent Company are confident that the subsidiary will prove a valuable addition to its assets.

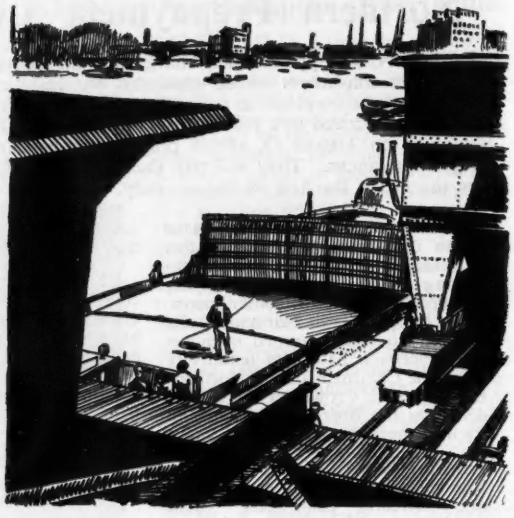
BRAILLE CENTENARY WINDOW DISPLAY

This interesting window display was arranged by the Northern Gas Board at the chief gas showrooms of the Newcastle division to mark the Braille centenary. The focal point was a lighthouse with coloured fluorescent rays, symbolising 'Victory over Darkness,' while all around were objects specially adapted for the use of blind persons, including a 'Regulo' Braille cookery chart and cookery book in conjunction with a Braille figured oven thermostat. To counter any suggestion that gas was taking advertising advantage of the sightless a display card carried the following message: 'The Gas Industry in assisting the blind to cook is happy in the fact that the scope of its work in this, as in other spheres, runs parallel with public welfare.'

Sea-borne Coal No. 2: North Thames

From Tyne to London River

A Century of Coal Carrying



A series of articles on the importance of sea-borne coal to the economics of the gas industry, written and illustrated by G. W. BATTISON, Editor of *Gas Service*

SINCE the Gas Light and Coke Company was established in 1812 a major part of London's gas supply has depended on the delivery of coal, from the North East Coast ports to the Thames, by sea. It is therefore not surprising that through the years a mode of transport so important to the economy of gas production should have woven round it a rich history. The 24 colliers now owned by the North Thames Gas Board are a far cry from the brigs of those early days, which carried only one-seventh of the cargo of the smaller, modern vessels.

The Company first became shipowners in 1830, acquiring the 'Laurel' for £470 and the 'Magnet' for £1,078, the high price of the latter being offset by the sale of its copper bottom, which was considered an unnecessary refinement for the North Sea. An enterprising novelist could find valuable material by delving into the history of these early colliers whose crews carried out one of the toughest and most dangerous jobs of their time. Take, for example, the pilfering by captains who delivered short weight and who were brought to book by the Company's intrepid Inspector of Ships in the Thames; or the attempt to scuttle the 'Dispatch' in 1853 as a gesture of protest against the use, on long-term charter, of the new steamships.

A craneman's view at Nine Elms jetty. Across the river is the hot water accumulator serving the district heating scheme for the Pimlico housing estate.

By this time the decline and fall of the brigs' popularity was unavoidable, for the march of progress was bringing many changes and innovations—among them the electric telegraph, which was adopted for communications between Newcastle and the Westminster office. No steam vessels were acquired by the Company until 1912 when the 'Fulgens' was commissioned. This ship, carrying 3,700 tons of coal, made some 50 round trips in the course of a year, and after giving excellent service was torpedoed off Haisboro in 1915.

By this time the coal supply position was in constant danger. With the outbreak of war it had been realised that if coal supplies were to be assured, the Company must secure its own fleet of vessels. In 1915 three second-hand collier ships were bought for supplying Beckton, and the Nine Elms boat 'Battersea,' which carried 1,250 tons and was the largest vessel that could be accommodated at Nine Elms works, was purchased from her previous owners. Eight more colliers were bought during 1916 and four in the following year, while another was under construction. However, losses were heavy and during 1917 seven ships had been lost; when the war ended only six vessels remained out of a total of 18 built or bought since 1912.

The early 1920's saw great developments taking place. The pier at Beckton was rebuilt to take ships carrying upwards of 4,500 tons and equipped with the latest cranes and conveyor system feeding the internal works railway by way of hoppers. Facilities were provided for loading barges for the lighterage of coal to Bromley and Stratford and, when required, to Nine Elms. Modern equipment was installed at Regent's Canal Dock to discharge colliers carrying up to 2,700 tons into barges for use on the canal to Shoreditch and Kensal Green. Finally, a wharf was constructed at Fulham which could take up-river colliers —that is, vessels sufficiently low built to permit passage under the 15 bridges to the Fulham works. At first this wharf could only handle vessels carrying 1,750 tons, but subsequent improvements to both the ships and the berth has increased this figure to 2,500 tons.

It was at this time that the foundations—if one may use the term—of the modern fleet were laid. The second-

hand vessels bought during the war were sold and new ones acquired. By 1925 ten new collier ships had been bought; a further eight were purchased by 1936. It was in this year that 'Mr. Therm,' the largest ship of them all, carrying 4,500 tons, was commissioned.

Such was the magnificent fleet which faced the hazards of the second World War. In the first three months two colliers were lost and were replaced by second-hand ships; a third was taken for use as a magnetic mine disposal vessel. Of three new colliers ordered, two were lost shortly after they were commissioned in 1941, four more were lost during the year, while the 'Halo,' an old timer bought in 1919, was mined in the river off Beckton pier and was raised and refitted after five months. Four new vessels were launched in 1942 with only one loss, and two more were added to the fleet the following year; in 1944 and 1945 there were two more additions, one of them, 'Firebeam,' the last steam collier to be added to the Company's fleet.

During the war period about 75% of the coal used came by sea, rather more than half of it—5,900,000 tons to be precise—in the Company's own fleet. These are the bare outlines of a story which reflects the greatest credit not only on the captains and crews of these ships, but also on the Company which took such pains to ensure the continuance of supply, even under the most hazardous conditions. Indirectly, too, there is the preservation of the industry's reputation for service to the consumer, and one wonders how many people took their gas supply largely for granted and to this day remain in ignorance of the sacrifices, both human and material, made on their behalf.

After the war a determined effort was made to modernise the up-river fleet, and five new vessels were ordered. These were all diesel-driven, the advantages of motor vessels with their increased cargo capacity, improved quarters for the crew and convenience in layout being recognised as a necessity if the fleet was to continue to improve. All these ships were designed to carry 2,600 tons and they were typical of the most modern type of 'flatiron,' their squat and plain appearance being amply counterbalanced by outstanding advantages below decks. 'Adams Beck' and 'Murdoch' came into service in 1949, and 'Accum,' 'Samuel Clegg' and 'Thomas Hardie' the following year.

The five new ships were more or less identical being 260 ft. long, propelled by an eight-cylinder British marine diesel engine of 1,180 b.h.p. at 225 r.p.m., with an average speed of about 10½ knots. When in the design stage, the crews were consulted about the type of accommodation they would like, with the result that single-berth cabins are fitted throughout, for both captain and officers amidships and engineers and crew aft. The cream-painted cabins were fitted with central heating and showers and wash basins adjoining.

The North Thames Fleet (as, of course, it became in 1949) now numbers 24, of which the oldest members are 'Afterglow' and 'Gaslight' which came into service 22 years ago. The improvement in comfort for the crew and ease of handling between these old ships and their modern sisters is very marked, and the disparity is likely to appear even greater when the Board's seven new colliers, now on order, come into commission.

For the year ended March, 1952, the Board's own colliers carried 2,575,000 tons of coal, as opposed to 1,124,000 tons carried by chartered vessels (the quantity received by rail was 1,219,000 tons). The reason why some 70% of the Board's coal is transported by sea is easily understood when it is pointed out that sea-borne coal into the riverside stations can be as much as 21s. per ton cheaper than the most expensive rail-borne stations. Chartered vessels are considerably dearer than the Board's own vessels, but they provide a degree of flexibility which is extremely valuable, and at times of shortage or, more rarely, of excess stocks, these ships belonging to other owners can be utilised as occasion demands.

At this point it must be made clear that although the North Thames Board is the owner of 24 collier ships, it does not manage them as the South Eastern Board manages its fleet (see the first article in the series, *Gas Journal*, July 2, p. 36).

So far I have dealt only with the collier ships. But the story of sea-borne coal does not end with its safe delivery

The waterfront at Beckton. In the foreground is the Board's tug 'Beckton,' the captain of which retired last month after more than 40 years' service, 26 of them as skipper of the tug.

at the works. The real benefits of this method of transport are only possible if the coal can be properly received and dealt with. Efficient conveyance is, therefore, half the battle. Before the coal can be carbonised it must be transferred with the utmost speed from collier to coal store, or direct to the retort house or coke oven. Delay at this stage renders useless even the most rapid and carefully scheduled transport system.

Unloading Facilities

At Beckton where the coal requirements per day can be as much as 10,000 tons, the task of discharging ships is particularly important. Some 6,600 tons can be used daily on the works, while another 2-3,000 tons may be loaded into barges and conveyed to Brentford, Bromley, Southend, Staines, Uxbridge, all of which depend on this method for much of their coal. There is, too, the question of storage. The normal stock is 240,000 tons, approximately six weeks' supply, some of the uptown stations having insufficient land area to stock large quantities. Beckton has three piers, one of them for receiving gas oil, etc., rented from William Cory and Son, Ltd., another for coal and the third equipped to load coke into ship by belt conveyor.

Each arm of the coal pier is provided with a belt conveyor of 1,000 tons per hour capacity which receives coal from the cranes and discharges on to a central conveyor of 2,000 tons per hour capacity feeding a 6,000 ton bunker.

The coal is discharged from this bunker through six rows of 18 hydraulically operated doors spaced for feeding 18 truck coal trains which can be filled simultaneously by operating a lever located within reach of the loco driver. Over-filling of the trucks is prevented since the height of the trucks is such that the flow of coal ceases as soon as the level reaches the hopper door.

The operation of loading 90 tons of coal into the trucks occupies about one minute after which the train continues its travel to a retort house where the coal is discharged into the bunkers by simultaneously opening the hopper bottoms of the trucks by compressed air from the loco.

A second coal storage bunker of 3,000 tons capacity receives coal by conveyors from the upstream arm of the coal pier and is designed to feed coal to either lorries or rail trucks or directly by belt to the coke ovens.

At present the bulk of the coal put to stock is stored either under an extensive overhead viaduct or in long heaps 12 ft. high from both of which it is reclaimed by diesel navvies.

A further system of coal storage is being installed in which the coal is fed by overhead belt conveyor to one long heap and spread and consolidated by bulldozers. The coal is reclaimed by an underground belt conveyor fed by bulldozers.

Only one collier at a time can be accommodated at Fulham where unloading is performed by three cranes. At Nine Elms the opening of the new jetty last May meant that for the first time all the Board's up-river colliers could be accommodated; formerly no vessels larger than 1,200 tons capacity were able to call there. The 360 ft. jetty (like Fulham it can take only one ship at a time) has three electrically driven cranes each with a 4 ton grab, handling 250 tons an hour. Two of these cranes can unload the largest of the up-river colliers in six to seven hours—more than twice as fast as before. The 3,200 ton hopper can be loaded, by means of conveyor belts, at the rate of 620 tons an hour.

That, in broad outline, is the story of how the North Thames Gas Board and its predecessors have built up, over nearly a century and a half, a highly efficient, and at times revolutionary, system of bringing its coal by sea. The story is up to date, but before bringing this article to a close, mention must be made of future plans. Very long delivery is required for new ships and future needs must be assessed well in advance.

At the time of writing seven new ships are being built, five of them of 4,600 tons deadweight, designed for running to Beckton. These large colliers are to be steamers and will be driven by North Eastern Marine triple expansion engines, incorporating super-heat and re-heat. Like many other ships in the fleet, they will bear the names of men who have played leading parts in Gas Light history: Sir David II, after Sir David Milne-Watson, Governor of the Company, 1918-45; David Pollock, the second Governor, 1815-46; Thomas Goulden, Chief Engineer, 1904-22; Frederick John Evans, Chief Engineer, 1863-72, and designer of the Beckton works; and John Orwell Phillips, Secretary of the Company, 1862-92, who was responsible for the policy of the amalgamation with made Beckton possible.

The other two new ships will be of the up-river type, about 2,700 tons deadweight, and powered by Clark-Sulzer T.D.36 eight cylinder diesel engines. Designed for running to Nine Elms and Fulham, they will be equipped with hydraulic deck machinery. The choice of names has again been influenced by tradition. One will be called Thomas Livesey, after the third Deputy Governor, 1815-40, who acted as Managing Director under David Pollock and who was the first of the Livesey family in the gas industry, while the other will bear the name Falconer Birks, after the present Deputy Chairman of the Board.

Fruits of Experience

The result of all the experience gained in the ships at present operated by the Board is being incorporated in these new ships and much consideration has been given to details of design and lay-out, to obtain regular running with the minimum of maintenance work. A great deal of attention has been paid to the provision of the best possible living and working conditions for members of the crew commensurate with the overall efficiency of the ships. There will be separate cabins for every officer and rating, and in addition to the officers' saloon amidships, there will be mess rooms for the engineers, petty officers and ratings. All these new ships will be equipped with the latest aids to navigation including Radar, Decca navigators, echo sounders and wireless telegraphy and telephony equipment, etc.

By continuing to improve its collier fleet, the Board is not only making provision for its future sea-borne coal —it is keeping the gas industry in the forefront of this type of marine design. The colliers are plain ships doing a plain job, but there are few vessels afloat more perfectly shaped to their purpose.

NEW COAL PROCESS

INCREASED yields of many important chemicals from coal are expected from a process developed recently by the Union Carbide and Carbon Corporation of Virginia, according to a *Daily Telegraph* Science Correspondent. The firm says that the chemical industry will be provided with a 'vast and cheap supply' of additional raw materials. Powdered coal is mixed with oils into a rough paste and is introduced into converters where, in high temperature and pressure, the coal combines with hydrogen gas and becomes liquefied.

Three grades of oil are produced which can be separated by normal distillation. They contain benzine, raw material for plastics, rubber and dyes; toluene, basis for the explosive TNT and as a solvent; phenol, material for many plastics; and aniline, used in dyes and as rocket fuel. Dr. C. C. Hall, of the Fuel Research Station, Boreham, Herts, an authority on hydrogenation, said that details of the process were awaited. It appeared to be faster than continuous processes used in Germany and Britain. America suffered from shortage of aromatic compounds which the process provided.

SPENT OXIDE BURNING

ECONOMICAL disposal of spent iron oxide was one problem at the Flixborough works, near Scunthorpe, Lincolnshire, of Nitrogen Fertilisers, Ltd. A secondary problem was the production of residues suitable for re-use as coke oven gas purification material.

The firm designed a new burner which they operated as a pilot plant for about 18 months before development on a commercial scale. Fully commissioned only a few months ago, the burner is now producing 17 tons of sulphuric acid a day from the sulphur recovered from the coke oven gas, and has already attracted the attention of other sulphuric acid producers at home and in other countries. This burner can be operated so that, after the 'burning' of the sulphur, the residues discharged from the furnace can be re-used for the extraction of sulphur from the coke oven gas.

The burner is a rotary kiln, 25 ft. long by 6 ft. 9 in. in diameter, lined with refractory bricks and fitted with a special alloy steel centre tube. The spent oxide enters the kiln at one end and, in passing through, combustion of the sulphur takes place. The residues of iron oxide are removed from the other end of the kiln by a rotary valve and conveyed to a bunker.

To ensure efficient combustion, the kiln has lifters which, as it rotates, cascade the spent oxide through the air over the full cross-section of the kiln. Air for combustion enters the kiln at the same end as the spent oxide, and after passing to the end where the residues are extracted, returns along the inside of the steel centre tube. The centre tube acts both as a means of ignition for the cold spent oxide entering the kiln, and as a secondary combustion chamber. There must be complete combustion of the sulphur and carbonaceous matter in the spent oxide or troubles might arise in the sulphuric acid process later.

The burner, it is claimed, is proving very economical to operate. For maintenance it can be cooled down in 24 hours, compared with a week for the traditional type of furnace, and can be back in production again within 12 hours after repairs.

The use of the burner makes other internal economies possible. By using the sulphur recovered from the coke oven gas instead of selling it to other consumers, the firm expect to save over £5,000 a year. It is anticipated that another £4,000 a year will be saved by using the iron oxide residues as purifying material to recover sulphur from the coke oven gas, and the company's consumption of imported Spanish pyrites will be reduced by 4,000 tons a year.

The Flixborough works, which covers 28 acres, employs some 320 people from Scunthorpe and the surrounding district. The main product is sulphate of ammonia for the parent companies—Fissons, Ltd., of Ipswich, and the West Norfolk Farmers Manure and Chemical Co-operative Co., Ltd., of Kings Lynn.

The foregoing is taken from *Target*, the bulletin produced by the Central Office of Information.

A New Flame Trap

THE Industrial Gas Development Committee of the Gas Council has released for publication a report from the Industrial Department of the West Midlands Gas Board's Birmingham undertaking on a new flame trap (report No. 506/52).

Flame traps, or fire checks, normally consist of diaphragms built up either as a multiple layer of gauzes or formed by winding a flat metal ribbon and a crimped metal ribbon together in a flat spiral. Usually a flame trap is fitted to each burner of an appliance working on fully aerated pre-mixed gas and other flame traps may be fitted to the main distribution lines downstream from the compressing plant. The flame trap is intended to arrest any flame that may enter the pipeline from the burner system and so prevent flame from reaching the compressor in which an explosion might result.

Some flame traps are designed with a built in valve which will shut when a flame burning on the trap diaphragm has melted a fusible link or has distorted a bimetallic locking system. Such devices are desirable, but the existing designs have a time lag and may be difficult to reset after a back fire has caused the valve to close.

To overcome these disadvantages, a new design has been developed by the Birmingham Industrial Department. This new design is very rapid in its operation and is easily reset. It can also be fitted with a warning system which will indicate that the fuel valve has closed and which will show which burner out of a number has back fired.

The device depends on the operation of a fine wire thermocouple placed immediately downstream of the flame trap diaphragm. The thermocouple is connected in series with a solenoid winding which holds a switch in the closed circuit position. The holding magnet of the switch is energised by a low voltage of the same order as that produced by the thermocouple. Actually the switch is held in a closed position by current supplied from a rectifier and the thermocouple is connected in series with the solenoid coil and the rectifier, but is so arranged in the circuit that the thermocouple current apposes the rectifier current. Thus, should a back fire cause flame to enter the burner supply pipe, a current will be generated by the thermocouple, which will neutralize the current from the rectifier and the solenoid will be de-energised and the switch will open the circuit. in which the fuel control valves indicator elements and fan controls may be connected.

As an indication of the rapidity of shutdown, it requires less than one second for the valve to be shut when using a thermocouple made from 19 g wire. To reset the valve it

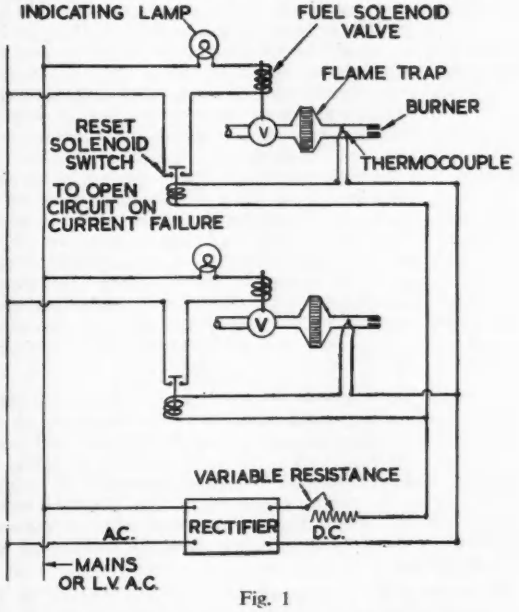


Fig. 1

is only necessary to press a button after the fuel valve has closed. Fig. 1 shows the flame trap arranged in a circuit incorporating an indicator device.

This development is the subject of a British Patent Application No. 13394 and is being manufactured by Ether, Ltd., Tyburn Road, Erdington, Birmingham.

ALTERNATIVE METHODS OF GAS PRODUCTION

By J. E. DAVIS, M.Inst.Gas E., F.R.I.C.,

Chief Technical Officer, South Eastern Gas Board

Paper at the Fifth International Gas Conference, Brussels

THE purpose of this paper is to take note of a trend of thought in the gas supply industry which has become evident in recent years; to enquire into the causes which may have stimulated that line of thought; to note the reactions so far as they are recorded at the present time, and to suggest the manner in which these causes may shape future development. It is prepared in the belief that the establishment and development of an industry is the response to public need. Further, that the public need is not static but changing and an assessment of the nature of these changes so far as it can be made is a necessary condition of sound development. The paper does not seek to propound any single solution to the changing requirements of the public, but rather endeavours to assemble alternative methods of gas production in perspective.

It is true that the argument is developed mainly with respect to conditions existing in Great Britain, but it is believed that with appropriate modifications it will hold for other countries too. As was shown by the paper given by M. M. Brabant to the Institution of Gas Engineers in London in May, 1951[1], there is a marked resemblance between the line of development and the present-day problems of the gas industry in Belgium and in Great Britain, and probably with others also.

Changing Circumstances

The production of gaseous fuel for public supply commenced with the essentially simple process of carbonisation of coal, and to this process the gas industry in Europe has remained loyal, as shown by the fact that during the first accounting period of the Gas Council, out of 482,789 mill. cu.ft. made available for sale, 347,186 mill. cu.ft. was coal gas[2]. In the United States of America the line of development from the commencement of the present century has been away from carbonisation, and indeed away from the use of coal as the basic raw material, first through carburetted water gas, employing progressively higher proportions of oil and lower proportions of coke, to the present situation where development is based mainly upon the exploitation of resources of natural petroleum gases. Gas supplied to consumers in the U.S.A. in 1945 comprised 25,500 mill. therms of natural gas and 4,550 mill. therms of manufactured gas[3]. It may well be that in the years ahead, depletion of natural gas resources may restore coal to the position of pre-eminence which it holds in European countries.

The duty of the gas industry, wherever it has been established, is the same—namely, to meet the demands of the public for gaseous fuel and to meet these demands with maximum economy in the use both of basic resources of materials and of financial resources, whether on capital account or from current earnings. It is a platitude to say that the effective discharge of this responsibility is becoming increasingly difficult, but it is less generally understood why this should be so.

The basic cause, giving rise to secondary causes, is undoubtedly the improving social conditions among the population served by gas and those members of the same population who have their part to play in making that service possible. The wider spread of special skills among the population, resulting from advances in the sphere of education and the development of technology, has given rise to an increasing dislike of work which depends upon muscular effort alone. In turn, this has led to a preference for the tasks involved in making finished products and the disposal of finished products in their multitudinous variety, rather than the tasks involved in the winning of the raw materials upon which all the structure of industry stands. At the same time, in all industry, and indeed in the home as well, the time and effort of the individual is given greater value which means, so far as fuel is concerned, that more fuel and more power are needed, and they are required to be available with the minimum of effort on the part of the user.

It is true that the margin of difference in financial reward between skilled, specialised work and heavy manual work may be diminishing, but this in itself exercises little restraint upon the general tendency. The effect upon gas manufacturing processes is seen in several directions, particularly in the demand for gas which, on account of its convenience and ease in use, is growing at a rate which outstrips the available supplies of raw material, and in the complexity of modern plant for coal carbonisation which achieves by mechanical means many of those tasks formerly carried out by heavy manual effort. It is useless to work for improved social conditions without recognising that these must inevitably mean a substantial increased demand for fuel and power, particularly of those kinds which give maximum effort, or to ignore the effect of such developments upon the type of work which men will be willing to accept.

In Great Britain changes of this nature have had a profound effect upon the cost structure of the gas industry over the past 15 years. Doubtless, the change has been accelerated by the war, but it would have been inevitable in time with changing social conditions. It is not simply a case that all costs have increased in terms of money, for if all had increased equally the cost structure would not have been affected. What has happened is that increases in certain elements of cost have been far greater than in other elements. As an example of the nature of the change, the following figures are given. Strictly speaking they relate to the South of England and they may not apply so closely in other parts of Great Britain, although the trend throughout is similar.

Coal Price Rises

The comparison of figures is between 1936 and 1951. During this time the price of coal to gas undertakings has increased in the ratio 100:330. At the same time the price of coal to domestic users (and it is this price which determines in large measure the price of coke) has increased in the ratio of 100:200. These two effects together have caused the net coal cost element to increase in the ratio 100:400. Process wages have increased in the ratio 100:200. The overall effect upon the cost of gas manufacture, excluding those elements related to plant cost, is an increase in the ratio 100:350. The cost of new plant has increased in the ratio 100:300, and although the effect of this change has not yet reached its full incidence, it is doing so rapidly because the higher price is paid not only in respect of new plant, but also in respect of maintenance, repairs, renewals, and replacements.

Against these changes in the elements of costs, the selling price has changed approximately in the ratio of 100:200, thus maintaining unaltered its relationship to domestic coal prices, but with a great difference in its structure. In 1936 the running costs of gas manufacture were covered by 30% of the total selling price. Capital charges, including main-

tenance, represented 15% of the selling price. Thus, only 45% of the total selling price was attributable to manufacturing costs. Today, the running costs of manufacture represent 52% of the selling price, and the capital charges 23%, the total costs attributable to manufacture being thus 75% of the selling price.

These changes must necessarily have a profound effect upon commercial policy, particularly in respect of tariffs, but they have had effect also upon the type of plant and process employed for gas manufacture and have stimulated in high degree the study of the economic consequences of load factor, peak loads, the maximum capacity of plant, the availability of plant, and the net cost of materials under various conditions of operation. Incidentally, they suggest a reason for the difficulties of the small gas undertaking which in 1936 was economically viable because its administrative and consumers' service costs were low and its manufacturing costs could therefore form a higher proportion of the total selling price than would have been appropriate to a large undertaking. When the proportion of the total costs in respect of manufacture has increased for the larger undertaking from 45% to 75% for the small undertaking it has exceeded 100%, and the continued existence of the small undertaking has become impossible without some form of integration or some radical change of practice.

This change in cost structure is regarded as one of the major causative effects underlying the present trend of thought on gas manufacturing processes. Its nature is perhaps less well understood than that of the second causative effect—the shortage of raw materials, although both may be regarded as arising from the general basic cause of changing social conditions. The shortage of raw materials falls to be regarded in both its general and its specific aspects. In its general aspect it delays the construction of new plant and retards the repair or renewal of existing plant, and in both these senses aggravates the problem of meeting increasing demands. Failure to meet these demands would, of course, aggravate the shortages themselves. In these circumstances it is understandable that efforts have been made to use existing plant in an unconventional manner to increase the thermal output above that for which it was designed, and while some of these attempts have been undoubtedly successful on a temporary basis, they can hardly be regarded as contributions to a permanent solution.

The Shortage of Coal

The specific shortage of most concern to the gas industry is the shortage in supply of its basic raw material—coal. This factor again has a two-fold effect in that it limits the ability of the industry to meet demands for gas and at the same time increases that demand because coal is short not only to the gas industry but to all fuel users. It is to be hoped, though the basis for the hope is far from firm, that the general shortage is a temporary factor associated with past and potential future military needs, but if the argument advanced earlier on the grounds of changing social conditions is a true one, the shortage of raw materials may be of longer duration until more acceptable means of winning these raw materials are developed. This applies particularly to the specific shortage in the supply of coal. But however much of these shortages may prove to be temporary, there is one major shortage which is permanent and likely to become more acute.

The successful operation of coal carbonisation as a means of gas production does demand supplies of special sorts of coal. The specification is not narrow and indeed modern carbonising plant will deal with quite a wide range of coals. But even within this range the economic results of the carbonising process may vary widely. This problem of the effect upon coal carbonisation as a gas-making process of the shortage of certain types of coal is often stated wrongly. Coal for any carbonising process should make a strong, saleable coke. If carbonisation is carried out for the production of coke for the metallurgical industry, then the caking property is that of greatest consequence. The known reserves of the best caking coals in Great Britain have fallen more greatly than the total coal reserves, and concern has been expressed about future supplies of coal for the manufacture of metallurgical coke. There is good reason to believe that this problem could be solved without undue difficulty or cost by the carbonisation of blends of coal, which would include considerable tonnages of coal not at present considered suitable for coke manufacture.

The problem of the gas industry is sometimes thought to be the same as that of the coking industry, but it is not. The gas industry carbonises coal to produce gas, and although the residue in the carbonising plant must coke sufficiently for it to be marketed as solid fuel, the strength of the coke is of far less importance in the economics of gas making than the yield of gas per ton. Coal blending is not likely to increase or even maintain the existing level gaseous therms per ton of coal carbonised and the concern of the gas industry is therefore not with the shortage, either present or future, of caking coals, but with the increasing shortage of 'fat' gas-making coals capable of giving a high yield of gaseous hydrocarbons on carbonisation.

Thus, summarising the causes of the present trend of thought, we see that:—

(a) The changing social conditions as a permanent factor and certain other conditions arising out of the late war and the present international situation (which may be of a temporary character) have altered the cost structure of the gas industry, causing attention to be focused particularly upon net materials cost and plant costs and the relationship of these two elements.

(b) The shortage of 'fat' gas-making coals which must be regarded as a permanent feature is leading to more interest in obtaining the maximum yield of hydro-carbons from such coal as is available, and the supplementing of this yield from other sources or by other means.

Change in Cost Structure

The striking change in cost structure to which reference has been made earlier has compelled greater attention to the manner in which the several elements of cost vary with circumstances. It is convenient to divide the cost elements relating to gas manufacture into three groups. The first group, which we may call 'net materials,' represents the cost of coal, coke, and oil plus handling and storage charges less the net revenue received for secondary products. This group may in present circumstances represent 30-60% of the total cost of gas. The second group is conveniently termed 'plant cost' and represents interest and depreciation on the capital invested in gas manufacturing plant together with the cost of maintaining the plant in efficient condition. This group may represent 30-50% of the total cost. The third group covers salaries, process wages, and stores and may represent 10-20% of the total cost.

It will be apparent that the two largest groups are net materials and plant cost. Although figures have been given showing the relative size of these two groups, this relationship refers only to plant operating for 240 days in the year. If the plant operates for more days in the year, the significance of plant cost becomes less and that of net materials becomes greater. Conversely, if the plant operates for fewer days in the year, the significance of plant cost becomes greater and that of net materials costs becomes less, and the studies of load factor which have been made in recent years have had as their objective the balancing of the variations of these two groups of costs so as to produce the most favourable overall result. A gas undertaking cannot expect to have a constant output of gas on every day of the year, but must be prepared to meet the fluctuating demands made by the public which it serves, the greatest variation in this demand being the seasonal change from summer to winter. It is possible that in the various studies which have been made too much emphasis has been placed upon the peak load and less than sufficient emphasis upon the seasonal load. The

peak load, which is experienced in its full severity only for a few days in a period of several years, may require quite special methods because, in view of its rare occurrence, it can well be regarded as an emergency. But the seasonal variation is something to be expected and to be dealt with every year.

There are two recognised methods of showing graphically the nature of the varying load which a gasworks must be prepared to meet. One of these is the single line chart developed by F. M. Birks and used by him in a paper presented to the International Gas Union in 1949[4]. This curve is well designed to show the intensity of the problem associated with the peaks experienced in a severe winter. The alternative method of presentation is the seasonal load curve showing the norm with lines of probable deviation from the norm. This method places emphasis upon the regular seasonal variation with temperature and shows the days of the year upon which abnormal peaks may be expected and the likelihood of those peaks occurring.

The single line chart is perhaps the better method for showing the number of days use which increments of plant are likely to have, and therefore for planning the plant installation, whereas the norm curve is perhaps the more useful for planning the programme of operation of plant. It also brings out the important fact that the most severe and embarrassing variations are unpredictable both as regards their magnitude in any particular year and as regards the time of their occurrence. Both methods of presentation illustrate the important fact that the maximum economy in meeting demands requires the installation of a mixture of types of plant in which the ratio of net materials cost to plant cost shall be different. Both of them give the basis for measuring the effect of load variation upon total production costs.

In an extensive area of gas supply, where there are several manufacturing stations linked together by a network of mains, the conclusions to be drawn from the load factor charts may need to be modified because the geographical situation of the various manufacturing centres may impose differences in the net materials cost, usually because of the difference in cost of transporting coal to the manufacturing stations, although the realisable revenue from coke may also be a factor. The geographical factor affects the overall cost of coal gas manufacture but does not, to any appreciable extent, affect the cost of manufacture of carburetted water gas. Here again we have an instance where one group of costs is influenced differently from another group of costs by the same set of circumstances, and hence the pattern is changed.

The consequence is that while the output curve may suggest a certain proportion of carbonising plant to total plant as being appropriate to one works where coal costs are relatively low, the same demand curve will require a smaller proportion of coal gas plant at a works where coal is more costly.

As a practical example of the two forms of chart expressing variation in demand, of the deductions to be drawn from them, and the modifications to these deductions imposed by geographical considerations, reference may be made to the extensive area of supply comprising South London and its contiguous rural districts. Examination of the records of experience over a number of years has led to the preparation of the normal curve for seasonal variation, shown as Fig. 1, and the corresponding single line curve, Fig. 2. While the maximum gas output on the highest single day may at times reach 1.7 times the mean, there is only a 1 in 1,000 chance that the mean day of the maximum week will be as high as 1.60 times the mean. It is, of course, impossible to guarantee that there will never in any circumstances be a demand in excess of this figure; nor is it possible to be completely certain that on the peak day every unit of plant will be available at its full capacity. On the contrary, it is known that at times of exceptionally severe weather there is an increased risk of the breakdown of plant. Difficulties of travel and the incidence of sickness may reduce the labour force available, and a high proportion of stored coal may have to be used. It thus happens that when the chance of the maximum output is greatest, the chance of maintaining maximum output is least. For this reason it is prudent to assess plant capacity as that which can be maintained for prolonged periods and to use the fact that most plant can be operated for short periods in excess of its rated capacity as an insurance against the difficulties which severe weather and maximum load must bring. If this is done, the installation of plant with a normal capacity of 1.6 times the mean day carries with it its own insurance against peak day difficulties.

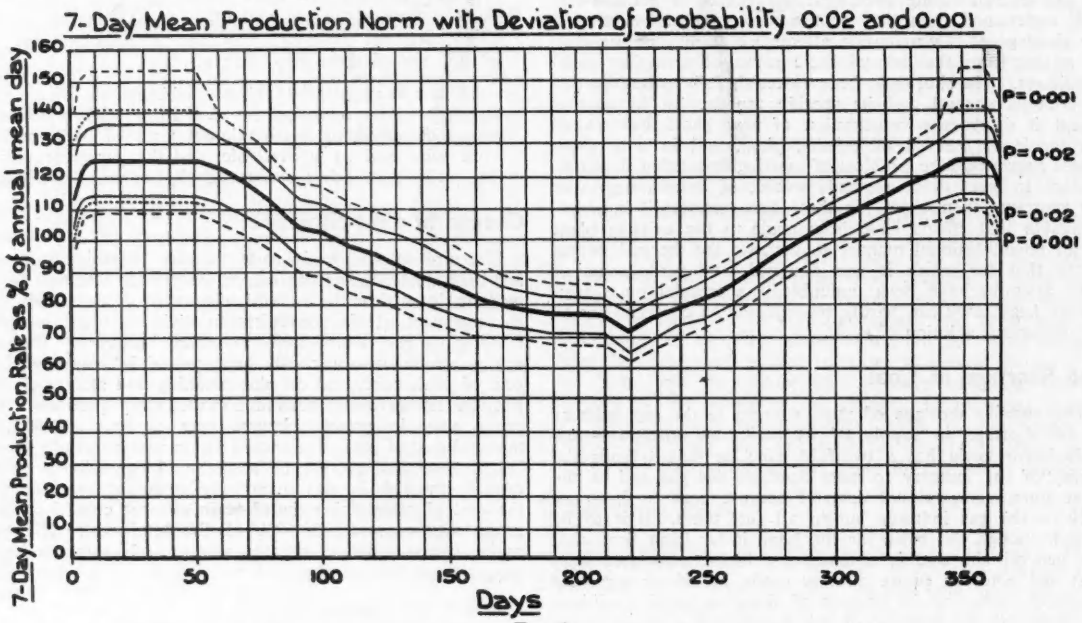
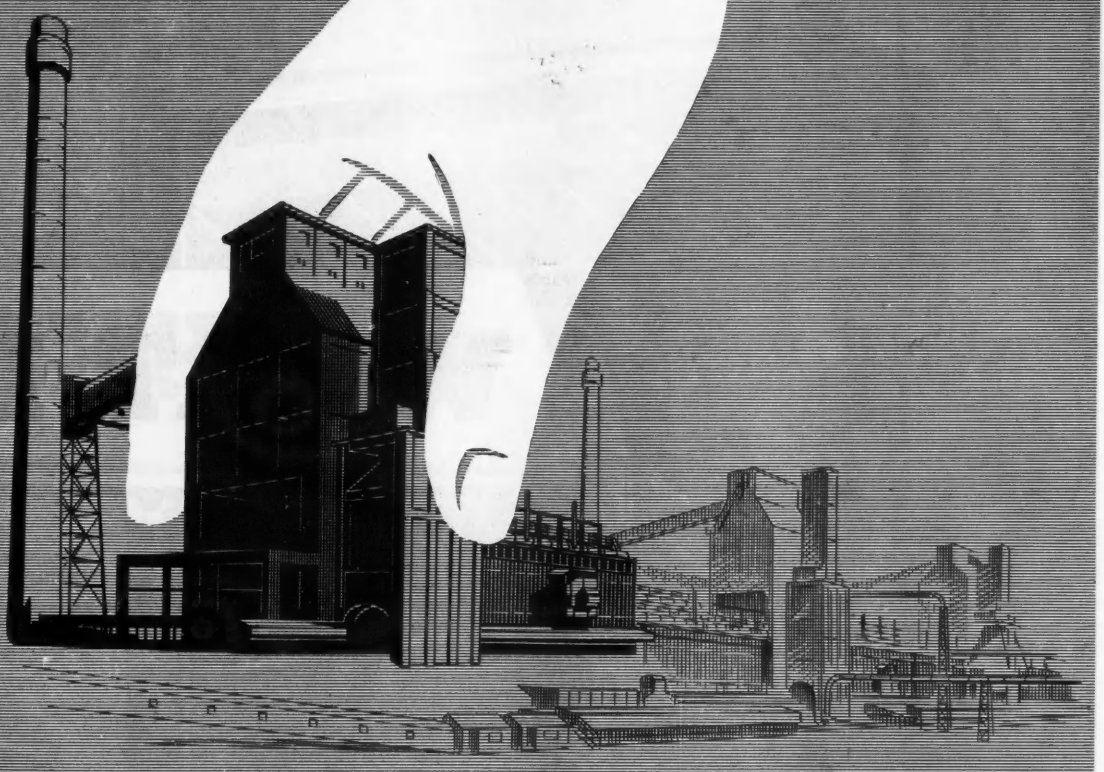


FIG. 1.

(Continued on p. 481)

and now—the 5th battery

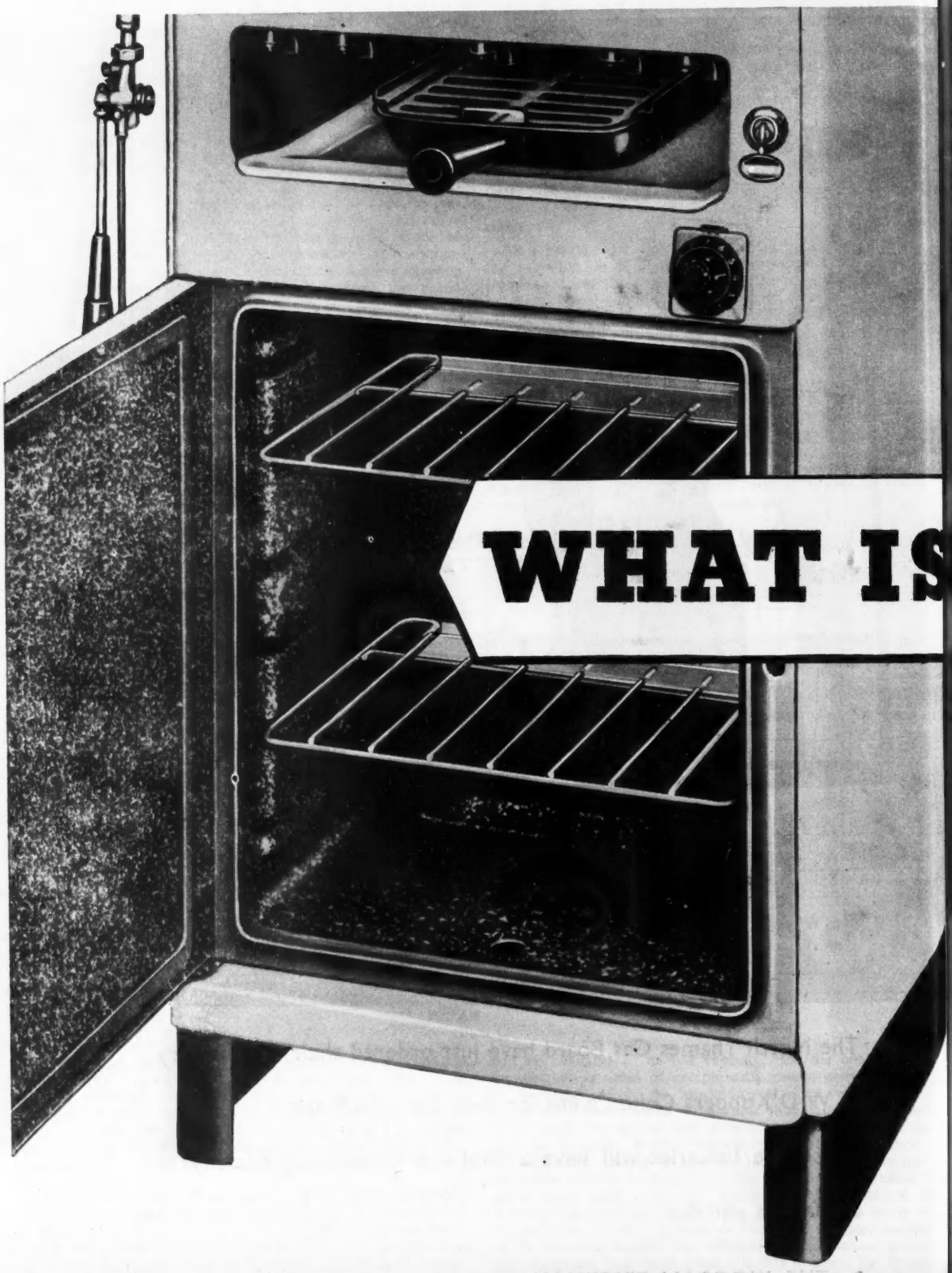


by Woodall-Duckham

The North Thames Gas Board have just ordered their fifth battery of W-D Koppers Coke Ovens for their Beckton Station.

These five batteries will have a total coal carbonising capacity of 3,000 tons per day.

THE WOODALL-DUCKHAM
VERTICAL RETORT & OVEN CONSTRUCTION CO. (1920) LTD.
Woodall-Duckham House, 63-77 Brompton Road, London, S.W.3
Telegrams : Retortical (Southkens) London. *Telephone : KENsington 6355 (10 lines)*


WHAT IS
NEW WORLD
NEW WORLD
NEW WORLD

Research

Design

Development

BEHIND IT ?

Radiation Ltd. was founded in 1919 when a number of leading gas appliance manufacturing companies were amalgamated. In 1922 the Radiation Central Research Laboratories were formed and were expanded as facilities and skilled technicians became available. This organisation was augmented in 1926 by the Research Kitchen and a year later by the Technical Service Department.

With this background of research, design and development it is not surprising that the NEW WORLD "Eighteen-Forty" Cooker combines all the most desirable features to make it the housewife's first choice.

RADIATION GROUP SALES LTD. Head Office and Showrooms:—7 Stratford Place, London, W.1. Tel. MAYfair 6462

NEW WORLD NEW WORLD NEW WORLD

THE FLAVEL '68'

THE POPULAR COOKER WITH THE BOW FRONT

MEDIUM PRICE ●
HIGHLY EFFICIENT ●
DELIGHTFULLY STYLED ●

FLAVELS *of* LEAMINGTON

MAKERS OF FINE QUALITY COOKING & HEATING APPLIANCES SINCE 1777

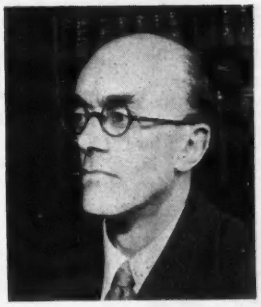
Catalytic Oxidation of

Organic Sulphur Compounds in Coal Gas

By R. H. GRIFFITH, Ph.D.,

Director, London Research Station, Gas Council, and Controller of Research, North Thames Gas Board

An Address given to the Golden Jubilee meeting of the American Chemical Society, New York



THE British gas industry has long been interested in the removal of organic sulphur compounds from coal gas. Although there is no statutory limit on the quantity permitted, it is considered that amounts below 10 grains of sulphur per 100 cu. ft. of gas are desirable, and that even as little as three grains would be preferable[12]. If such low concentrations were attainable at a reasonable cost there would be a very appreciable increase in the scope of flueless space heating appliances, and a striking reduction in the cost of maintenance of instantaneous water heaters, on which corrosion now imposes a significant charge. There is also a growing demand for reducing atmosphere units in the metallurgical industries; gas with a very low sulphur content is essential for many of these.

The sulphur compounds which are normally present in coal gas are carbon disulphide, carbon oxysulphide, and thiophen; there may also be traces of thiols and other more complex bodies. The relative and absolute quantities depend on the kind of coal carbonised and on the plant used in the process; typical analyses are shown in Table 1 for gas produced in horizontal retorts or in continuous vertical retorts.

TABLE 1.

	Horizontal Gas	Vertical Retort Gas
CS_2 equivalent grains S/100 cu. ft.	20.1	21.0
COS "	5.4	5.5
Thiophen "	7.8	3.8
Other comps. "	2.3	1.4
Total "	35.6	31.7

With some coal now in use, the total sulphur content may be as high as 50 grains per 100 cu. ft.

The possibility of a catalytic process for the decomposition of these compounds was established by Carpenter in 1913[1]. The catalyst was shown by Evans and Stanier[4] to be nickel subsulphide Ni_3S_2, and it is interesting to note that the use of a sulphide catalyst was discovered at such an early date in the gas industry. The first plant of the South Metropolitan Gas Company had a capacity of 1.5 mill. cu. ft. per day and a later installation treated 100 mill. cu. ft. per day. The catalyst was prepared by soaking broken firebrick in nickel chloride solution, followed by heating to 500°C. It operated at about 430°C., the gas being raised to this temperature in a coke-fired preheater, and led to the conversion of the organic sulphur compounds to H_2S.

This process was not widely adopted by the gas industry, largely because it was expensive in fuel and maintenance. Renewed attention was given to the problem in 1936, and a modified process was developed in which the organic sulphur compounds were decomposed by catalytic oxidation[11].

Nickel Subsulphide Catalyst

China-clay pellets, prepared by cutting an extruded paste, were fired at 900°C., and the finished material had a surface area of 15 m²/gramme. The pieces were cylinders about ¼ in. diam. and ¼ in. long. They were impregnated with a boiling solution of nickel sulphate, then dried and reduced in coal gas at 400°C.[5]. This gave a product in which about 8% of Ni_3S_2 was uniformly distributed on a robust support, and the finished catalyst had a surface area of 18 m²/gramme.

The kinetics of the oxidation of CS_2 and COS on Ni_3S_2 were studied by Crawley and Griffith[3]. Using nitrogen as the carrier gas, it was necessary to inhibit the gas-phase oxidation of the sulphur compounds by adding traces of ethylene, and under these conditions the oxidation of CS_2 proved to be of zero order in regard to CS_2. By contrast, the oxidation of COS was of the first order in respect of that substance but was retarded by the SO_2 formed. These results, together with other work on the chemisorption of sulphur compounds by Ni_3S_2[9], showed that chemisorbed CS_2 is oxidised by impact of oxygen on it, but that COS reacts by collision with chemisorbed oxygen. It is interesting to note that the CS_2 in coal gas would be completely oxidised by small amounts of oxygen in a gas-phase reaction if that process were not retarded by the ethylene and hydrogen present.

Many other reactions are catalysed by Ni_3S_2, and two of them are significant in the practical operation of the sulphur removal plant. These are:—

(1) $2H_2 + O_2 \rightarrow 2H_2O$.

(2) $SO_2 + 3H_2 \rightarrow H_2S + 2H_2O$.

The first of these is important as it provides a strongly exothermic reaction which can be controlled to supply all the heat requirements of the process. At relatively low temperatures the reaction is of zero order in regard to oxygen so that the temperature of the catalyst bed cannot be raised by the addition of more oxygen if it has been allowed to fall below about 175°C. At the normal working temperature the reaction rate is directly proportional to the oxygen concentration. In spite of the ease with which the formation of water occurs, and of the high concentration of hydrogen in the system, the sulphur compounds still undergo oxidation. Only when the oxygen concentration is low does the reaction between SO_2 and H_2 become appreciable. This reaction has been studied by Crawley and Griffith[2] who found that it was of the first order in regard to SO_2, and slightly retarded by excess of that reagent which was strongly adsorbed.

Thiophen is not decomposed, either by oxidation or by hydrogenation. It has been shown by Griffith, Marsh, and Newling[10] that thiophen can be hydrogenated on Ni_3S_2 in pure hydrogen, only by interaction with metallic nickel produced from the catalyst. Its decomposition is completely inhibited by substances present in coal gas which prevent the formation of free nickel.

The Catalytic Plant

In 1938 a plant rated at 1.5 mill. cu. ft. of coal gas per day was put to work at Harrow, 14 months after the catalytic oxidation reaction was first observed in the laboratory. The plant was designed as an effective operating unit which would provide fuller information for a much larger installation. The main features of the plant are shown in Fig. 1.

Gas from the horizontal retorts, which has passed through the normal purification system, enters the heat exchanger E, travels over the outside of the tube bundle and leaves by the

manifold F. It is then distributed to three of the four catalyst vessels A, B, C, D, each of which holds 15 cu. ft. of catalyst. The treated gas returns by the manifold C to the tubes of the heat exchanger.

The heat exchanger is a two-pass unit, each half containing 178 steel tubes 12 ft. long, 1.25 in. O.D., 1.09 in. I.D. arranged on 1.56 in. triangular pitch inside a cylindrical shell 35.25 in. I.D. Gas flow on both sides of the tubes is parallel to their length. The usual floating head construction allows for expansion on heating, and the movement of the shell is allowed by mounting on rollers.

The catalyst vessels are 4 ft. 6 in. high, 3 ft. in diameter, and have conical grids with 45° slope leading to a 2 in. discharge pipe extending through the gas inlet connection. A charging point is provided in the top cover. The vessels are suspended by slings so that they can move independently. All hot surfaces are well insulated.

Treated gas leaving the heat exchanger enters a washer-cooler of conventional design for the removal of SO_2 and water vapour. It is 30 in. high, 3 ft. diam. packed for 18 ft. 2 in. of its height with ½ in. wooden boards at ½ in. spacing, to which liquor is distributed from a multi-trough

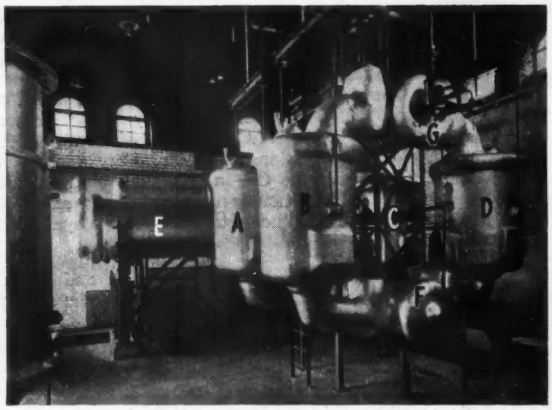


FIG. 1.

system. The liquor, prepared from a dilute sodium carbonate solution, is delivered by a centrifugal pump from a storage tank through a rack cooler at about 180°C.

The washed gas still contains traces of H_2S, generally 2-3 grains per 100 cu. ft. which have to be removed by iron oxide. At Harrow, this is done by passage through a single box of conventional design, which was already available.

As no other external source of heat is provided, an air burner is necessary for starting from cold. This is shown in Fig. 2, and is fitted into the upper trunk main at G. Air is fed to the nozzle A and draws in gas through the chamber E in amount controlled by valve J. Ignition is by sparking plug B, and the flame can be observed through a window. It is important to operate this burner with a smokeless flame to prevent deposition of soot in the heat exchanger. A self-supporting reaction can be attained in 5-6 hours from cold, and the air burner is then shut off.

Working Conditions and Performance

The precise conditions on the plant depend on the age of the catalyst and on the volume of gas being treated, but the average temperatures are as follows: gas entering catalyst 220° maximum in catalyst 370°, inlet heat exchanger 355°, treated gas to washer 145°. This needs an oxygen consumption of about 1.2%. The washer-cooler liquor has an average concentration equivalent to 1.8% Na_2CO_3 and is circulated at 30 gal. per 1,000 cu. ft. of gas. Three times daily an addition of fresh Na_2CO_3 is made, and some spent liquor is rejected to compensate for water accumulated by condensation and to keep the pH above 7.5 so that sulphur oxides are properly removed.

Table 2 gives typical data for two weeks in 1943.

TABLE 2.

Total sulphur content of treated and untreated gas.

Date	Hot Gas Entering Heat Exchanger	Total S in	Total S out. grains/100 cu. ft.
July 6	388°C.	26	10.9
7	388	26	7.9
8	399	28.7	8.9
9	393	29.1	9.2
12	397	29.3	9.9
15	393	30.6	8.5
16	391	32.4	9.1
19	387	31.5	10.2

Of the residual sulphur all but 1.5-2.0 grains per 100 cu.ft. were thiophen, and when the treated gas had passed through

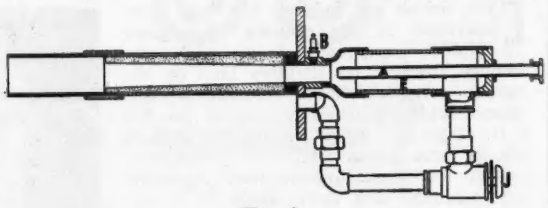


FIG. 2.

a benzole recovery plant its final sulphur content was about 5 grains per 100 cu. ft.

Control of the Plant

When first installed the plant was controlled by hand setting of air addition to the ingoing gas as both the rate of gas flow and its oxygen content may vary widely. This needed the attention of one man twice hourly, and was continued during the war. Automatic control systems have recently been examined with particular reference to their suitability for plants of larger capacity, and it has become evident that the addition of air can be controlled from a sensitive oxygen meter

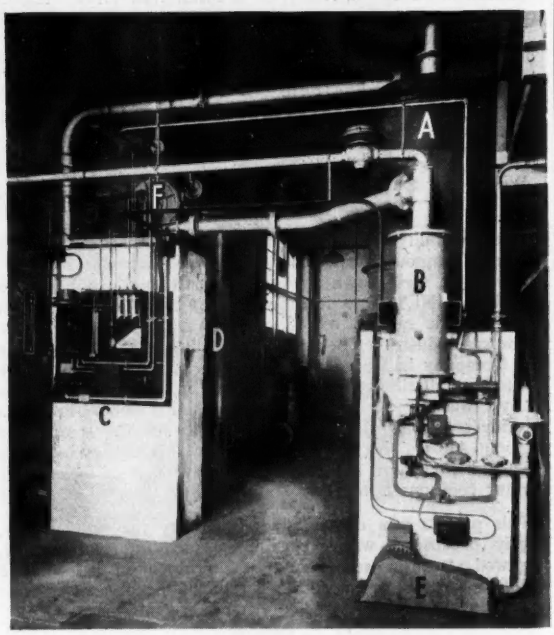


FIG. 3.

to give a constant oxygen concentration at the inlet to the plant. A magnetic instrument supplied by George Kent, Ltd., Luton, has proved suitable for this purpose.

A slow deposition of fouling material takes place on the catalyst, the actual rate depending on the temperature and on

the type of gas treated. Two kinds of fouling agent have been recognised[13]. At relatively low temperatures small amounts of hydrocarbon polymers of medium molecular weight obscure the active surface. As the temperature rises to 420°-380° these polymers are decomposed to a less objectionable and more porous deposit. But even this deposit seriously affects the interaction of hydrogen and oxygen on the catalyst when it amounts to about 6% by weight of the catalyst.

Regeneration of the catalyst is effected by controlled oxidation of the carbonaceous material at the lowest practicable temperature, followed by reactivation of the nickel oxide-nickel sulphate mixture by contact with hot coal gas at 400°C. If the temperature in the oxidation stage is allowed to exceed 600°, interaction between china clay and nickel oxide sets in and leads to permament damage to the catalyst, and a process has therefore been developed which uses gas with a low oxygen content to burn the impurities.

The normal life of catalyst at Harrow is three to four months, so that the volume to be regenerated each year is small. A regenerator unit with a capacity many times as great as would be needed for this has been installed so that it will handle material from several larger plants.

The Catalyst Regenerator

The removal of the fouling material from spent catalyst by controlled combustion is carried out in the regenerator shown in Fig. 3. Each 7 cu.ft. batch is transported in a single full-aperture drum to which attachments are made so that it may be lifted and inverted to form a cone-based feed hopper over the kiln A. Inside the insulated refractory lining of the kiln on a double discharge cone of special sheet steel is the underbed of 3½ cu.ft. of oxidised catalyst from the previous operation on to which the 7 cu.ft. of unburnt material is fed.

About 10,000 cu.ft. per hour of inert gas containing 2% oxygen is then passed upwards through the charge at an entry temperature of 420°-440°C. The fouling material is removed in about six hours without the temperature exceeding 580°C. in any part of the charge.

The oxygen-free waste gas then travels upwards through the 16 in. diam. cast iron washer-cooler B to be cooled and washed free from sulphur oxides; the 5 ft. packing of 1 in. earthenware rings is irrigated with hard water.

A centrifugal booster C provides pressure for recirculation of clean, cold waste gas and draws in, through a venturi proportioner, enough air to restore the oxygen concentration to 2%. Excess gas is then blown from the circuit through a relief governor.

The remaining cold waste gas, about 8,000 cu.ft. per hour, is recycled to the kiln through the chamber D in which it is raised to 420° to 440°C. by admixture with about 2,000 cu.ft. per hour of gases from an air-blast burner. Thermostatic control of air flow from the blower E to the burner gives a constant temperature at the kiln entry. Control of the gas to the burner by the venturi proportioner ensures that the hot products from the burner contain 2% oxygen and practically no combustible gas.

A CO_2 indicator on the recycle gas shows when the oxidation of the charge is complete; 7 cu.ft. of material is then discharged through a special valve and adaptor hood into a full aperture drum on a bogie. After cooling, this batch is screened to remove dust and is then ready for reactivation in hot coal gas.

The plant is brought into operation by three press-buttons mounted on panel F for the booster starter, the air blower starter, and the sparking-plug ignition of the pilot air-blast burner. An electrode in the pilot flame then opens the magnetic valves for the main burner. Safety is ensured by sequence inter-locking of the starters and the ignition, by the relay system operated from the flame electrode, and by safety switches which operate if the cooling water fails or if there is inadequate flow of recycled waste gas.

Small-scale Sulphur Removal Units

For use on consumers' premises where low sulphur gas is not available, small catalytic units have proved very useful, notably in the preparation of reducing atmospheres for metallurgical purposes. They have ranged in size from 500 to 12,000 cu.ft. of gas treated per hour, the standard space velocity being 1,000 vols. per hour. A unit to treat 1,000 cu.ft. of gas per hour which contains 1 cu.ft. of catalyst is shown in Fig. 4 described below.

On this scale of operation, heat exchange between treated and untreated gas is not practicable, and a gas fired preheater A is therefore provided. In this, the ingoing gas passes downwards inside the stainless steel tubes mounted in a lagged cylindrical shell through which the hot gases pass upwards from the burner. The heating gas is controlled by a direct-acting thermostat.

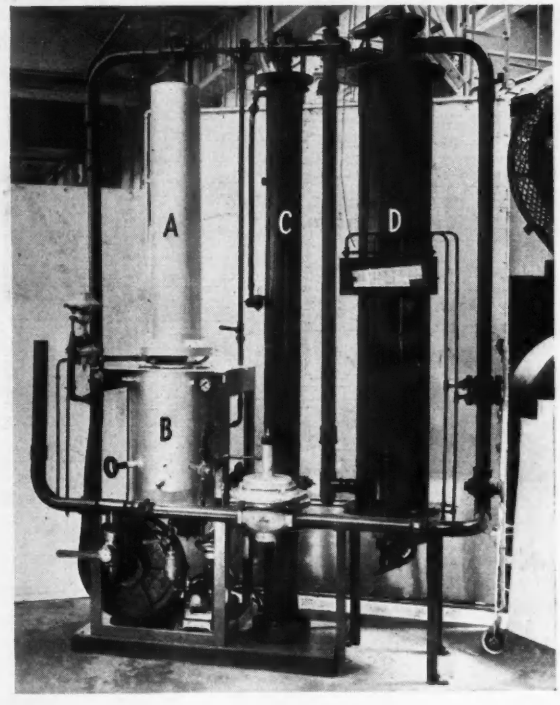


FIG. 4.

The catalyst vessel B is a lagged steel cylinder holding a bed 16 in. deep on a flat grid, through which gas preheated to 300° flows downwards. The maximum temperature reached is about 380° and this is controlled by thermostatic adjustment of air added to the inlet gas.

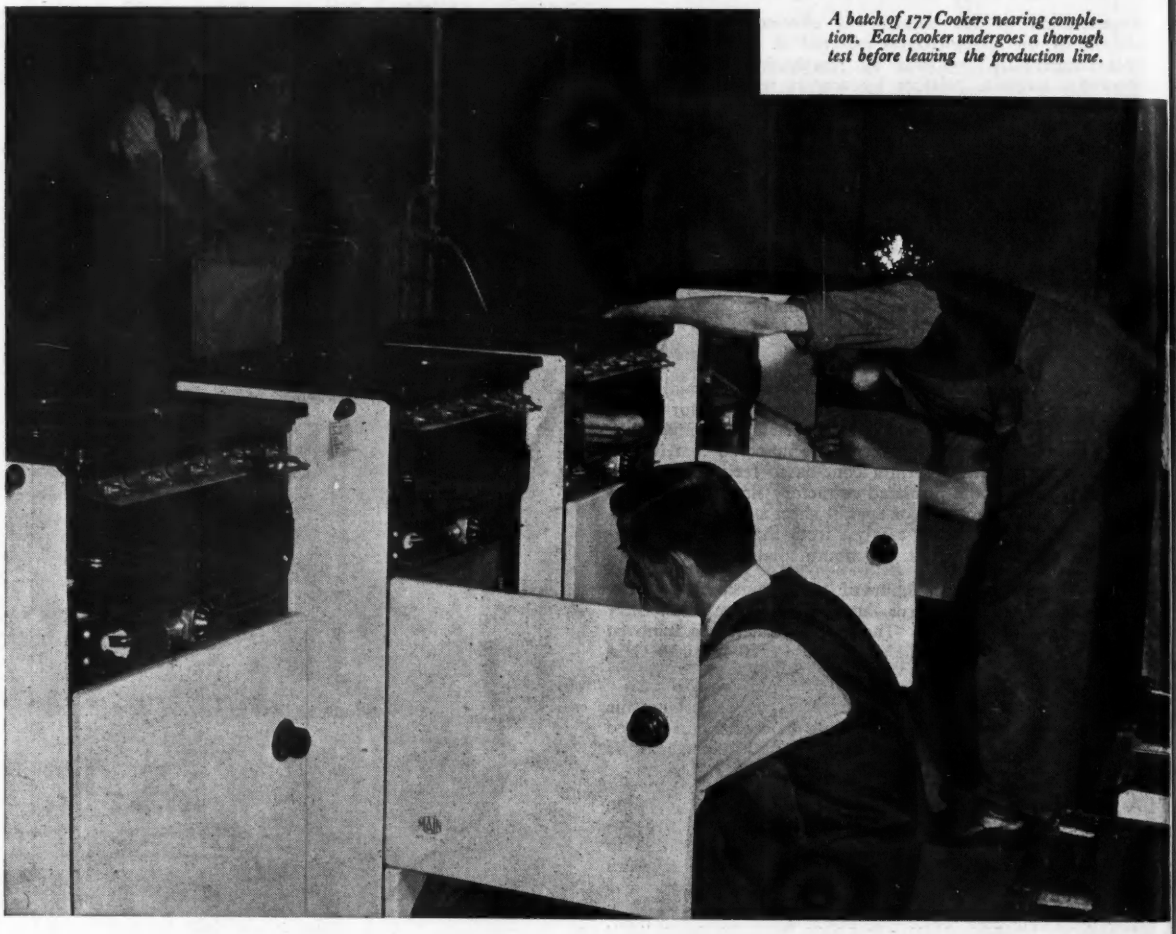
The treated gas passes to the washer cooler C, which is packed with 1 in. ceramic rings to a depth of 5 ft. and irrigated by hard water flowing counter-current to the gas. The water runs to waste after one pass and removes sulphur dioxide as well as cooling the gas to a temperature and dew-point below atmospheric.

The catch purifier D contains 5 cu.ft. of active iron oxide spheres[7] from which small amounts of the packing can be removed pediodically, new material being added at the top. Any hydrogen sulphide present in the gas is thus removed and it is ready to go to the burners.

Flow meters, safety devices, pressure controls, and means for working on reduced load or against back pressure are incorporated in the completed unit. The plant can normally be started from cold in about 2-3 hours and will run for long

(*Concluded on p.* 481)

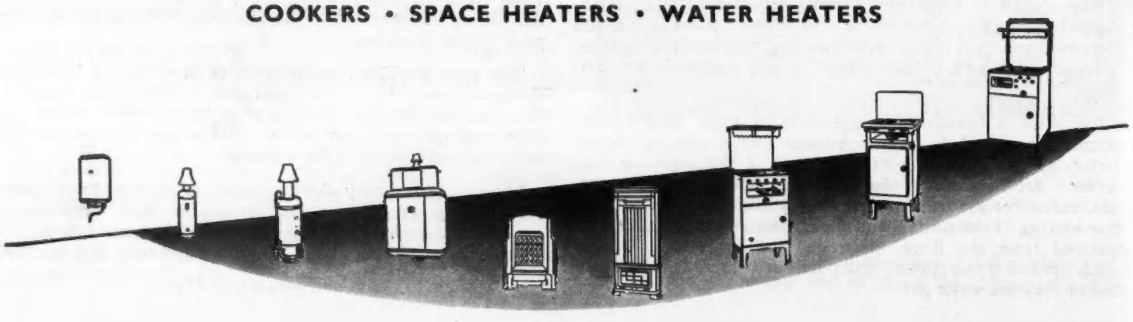
quality production



A batch of 177 Cookers nearing completion. Each cooker undergoes a thorough test before leaving the production line.

main GAS APPLIANCES

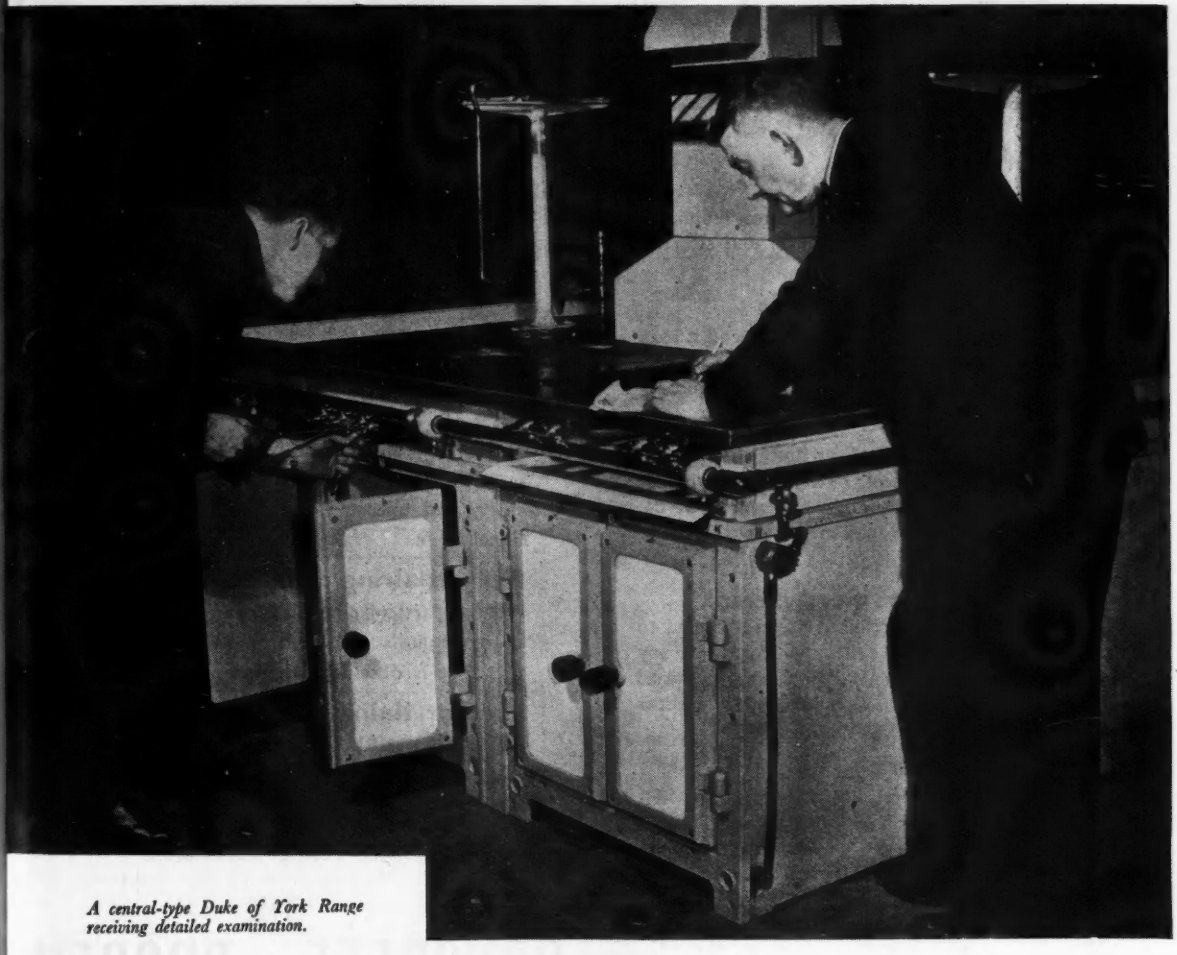
COOKERS • SPACE HEATERS • WATER HEATERS



IN GAS APPLIANCE MANUFACTURE

close examination during and after fitting

At all stages of assembly, Main gas appliances receive careful scrutiny by keen-eyed examiners. The progress of each appliance is studied in detail until it reaches the finished stage when it is given an exacting test under working conditions.



A central-type Duke of York Range receiving detailed examination.

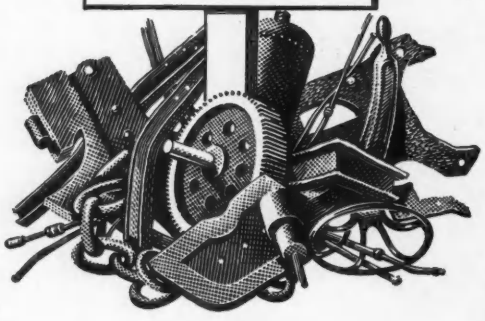
R. & A. MAIN LTD · MAIN WATER HEATERS LTD.

MAIN

MT/751

WHAT EVERY MANAGEMENT SHOULD KNOW ABOUT

scrap



What is scrap?

Obsolete plant and machines, old spares, redundant buildings—anything made from iron and steel for which you have no foreseeable use.

What good is it to me?

No good at all in its present state. But send it back to the steelworks and it can go to make the new steel that you and all steel-users need. Remember—a ton of scrap may make a ton of new steel.

Can't they make steel without scrap?

Yes—but not enough steel. Last year, 58% of our steel was made from scrap. The more scrap we use the more coal, coke and iron ore we save for other important purposes.

What should I do with my scrap?

See your local scrap merchant. He will be glad to help with dismantling and collection. If you have any trouble disposing of iron and steel scrap, write to the British Iron & Steel Federation for the address of your Joint District Scrap Committee.

What shall I get for it?

You will be paid a fair price for your scrap. MORE IMPORTANT—you will be doing yourself and all steel-using firms a great service by helping to increase steel production.

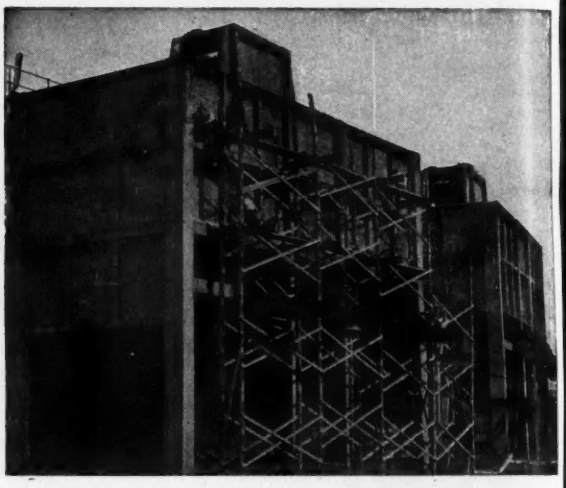
SPEED THE SCRAP

SPEED THE STEEL

Issued for the STEEL SCRAP DRIVE, by the British Iron and Steel Federation and the National Federation of Scrap Iron, Steel and Metal Merchants

T.28

Gunite



One of the reinforced concrete structures reconditioned with Gunite for the City of Carlisle Gas Undertaking.

Gunite—concrete applied by air pressure—has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied

For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

Handbook "GUNITE" sent on request

THE CONCRETE PROOFING CO., LTD.

100, VICTORIA STREET, S.W.1

Telephone: Victoria 7877 & 6275

periods with very little supervision. The rate of fouling of the catalyst is generally much lower when running on town gas than that experienced on the large unit on coal gas, and a life of two years has been reached in many installations.

Design of Future Installations

Owing to the outbreak of war, the construction of larger plants for organic sulphur removal was not possible in 1939, and subsequently a general reconstruction programme has still delayed such work. But plans have now been completed for a new plant having 10 times the capacity of that at Harrow and a few of its chief characteristics have been described[13].

No change is contemplated in the chemical principles already demonstrated but improvements have been made in the design of catalyst vessels and heat exchanger to give economy in capital and running costs. A relatively larger heat exchanger of new design[8] will be provided so that the exit gas temperature is 80°C. The catalyst will be placed in a single vessel, through which gas will flow horizontally. This will be subdivided into compartments by vertical grids so that sections of the catalyst can be removed separately for regeneration[6]. By the improved heat exchange and reduced heat losses the consumption of oxygen burned to provide the heat for the process will be lowered from about 1.25% to about 0.8% by volume. Direct cooling of the liquor supplied to the washer-cooler will also obviate the installation of rack coolers, which were convenient at Harrow because a plentiful supply of cold water was available.

The decrease in the running cost will partly offset the considerable increase in the capital cost of any new plant. Although any estimate of expenditure is now very approximate it is anticipated that the process will add less than 2% to the cost of the distributed gas.

BIBLIOGRAPHY.

1. Carpenter, C. *Gas Journal*, 1913, **122**, 1010 ; **123**, 30.
2. Crawley, B., and Griffith, R. H., J.Chem.Soc. 1938, 720.
3. Crawley, B., and Griffith, R. H., J.Chem.Soc. 1938, 2037.
4. Evans, E. V., and Stanier, H., Proc.Roy.Soc., 1924, **105A**, 626.
5. Gas Light and Coke Company, Griffith, R. H., and Plant, J.H.G., B.P. 529,711, U.S.P. 2,295,653.
6. Gas Light and Coke Company, Griffith, R. H., and Plant, J.H.G., B.P. 597,501.
7. Gas Light and Coke Company, and Hopton, G. U., B.P. 567,231.
8. Gas Light and Coke Company, and Newling, W. B. S., B.P. 619,585.
9. Griffith, R. H., and Hill, S. G., *J. Chem.Soc.*, 1938, 717.
10. Griffith, R. H., Marsh, J. D. F., and Newling, W. B. S., Proc. Roy. Soc,. 1949, **197A**, 194.
11. Griffith, R. H., and Plant, J. H. G., *Gas Journal*, 1944, **244**, 48.
12. Institution of Gas Engineers, Report on the removal of organic sulphur compounds from town gas. Comm. 146, 1936.
13. Plant, J. H. G., and Newling, W. B. S., Inst. Gas. Eng. Publication 344/157, 1949.

ALTERNATIVE METHODS OF GAS PRODUCTION—Continued from p. 470.

It is to be noted that the average winter output will be 1.25 times the mean day, with peaks rising to 1.4 times the mean day. This implies that while we may regard the normal and natural seasonal variation as moving between 0.75 of the mean day for the summer period and 1.25 of the mean day for the winter period, the unpredictable and occasional peak is the difference between 1.25 and 1.60 times the mean, and we see that while the range between 0.75 and 1.25 can be covered conveniently and economically by combinations of suitable proportions of carbonising plant and water gas plant, there is a great need for special treatment to cover the range between 1.25 and 1.60 times the mean However, before giving further consideration to this point, it is appropriate to consider the method of meeting the normal seasonal variation.

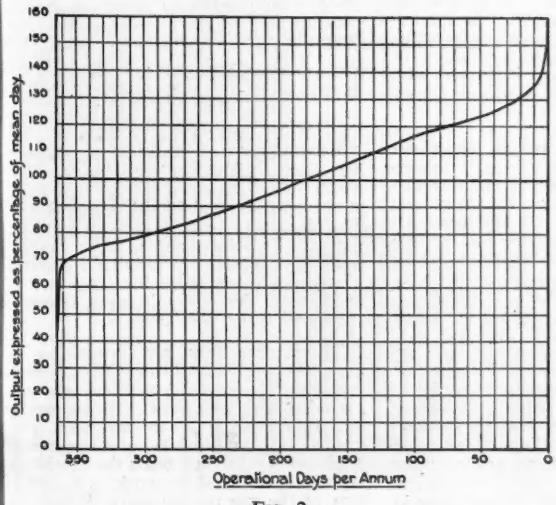


FIG. 2.

Some of the manufacturing stations in the area under consideration are situated by the River Thames and can unload coal direct from colliers. Other manufacturing stations are situated some miles inland and the cost of coal to these works is increased by rail transport charges. Given a load factor of 240 days working per annum, coal gas made at the riverside works shows a lower overall cost than carburetted water gas at 500 B.Th.U. per cu.ft. wherever it is made, the higher plant cost for the carbonising process being more than compensated by the lower net materials cost of coal gas compared with water gas. On the other hand, at the works remote from the river the rail charges increase the net materials cost of the carbonising process and there is then little to choose in overall cost between the coal gas and water gas.

REFERENCES

1 The Development of Gas Production in Belgium, 1900-1951. Brabant, *M. Inst Gas Eng. Comm. No.* 383.
2 The Gas Council First Report and Accounts, July 1948—March, 1950.
3 Manufacture of Fuel and Synthesis Gas in the United States. Newman, L. L., Schmidt, L. D. and Batchelder, H. R. Fourth World Power Conference, London, 1950.
4 The Characteristics of Gas Making Plant to Meet the Seasonal Heating Load. Birks, F. M. Fourth International Gas Conference, London, 1949.

(To be continued).

INDUSTRIAL DRYING

THE Department of Scientific and Industrial Research has published a 'Bibliography of Industrial Drying,' price £1 7s. 6d. ($6 25c. U.S.A.), by post £1 8s. 7d.

The value of efficient drying processes to industry has grown in recent years with the great need for fuel saving. The exchange between those concerned of up-to-date information on drying problems can help to speed the use of methods of drying that may lead to improved efficiency and output.

The bibliography now published covers the period 1924-50 and its 800 pages carry some 4,500 entries. The first two sections of the work deal with principles, processes, and equipment, and include a limited number of references on heat transfer and drying of gases. A further three sections cover the various drying methods that can be used in agriculture, in the food processing industry, and in the drying of industrial materials. Each section is divided by sub-headings under which the references are listed alphabetically.

'Bibliography of Industrial Drying' can be obtained only from the Department of Scientific and Industrial Research, Technical Information and Documents Unit, Cunard Buildings, Regent Street, London, S.W.1. Cash must be sent with orders.

TRADE NEWS

Stotts of Oldham

BLACKPOOL School of Catering, a branch of the College of the Fylde, is a renowned centre for the instruction of future chefs. Students from all over the world enrol there to learn the subtleties of high quality cooking, the preparation of enticing menus, and how to combine these with catering for large numbers as a matter of efficient routine.

The school kitchens are equipped with the best of modern automatic equipment including boiling pans, steamers, frying ranges, café sets, and hotcupboards by Stotts of Oldham. Their layout is based on a pattern that experience has found to be the best for the complicated movement of kitchen traffic. Consequently, from the first day of their training, these young people accustom themselves to up-to-date practice in hotels and canteens with modern equipment and their intensive and comprehensive course ensures their success as the chefs of tomorrow.—*James Stott & Co., Ltd., Oldham.*

Chaseside

THE various points of improvement in the Chaseside shovel shown at this year's Mechanical Handling Exhibition at Olympia are illustrated and described in a well laid out folder issued by the Chaseside Engineering Co., Ltd. The new shovel combines the advantages of cable operation with finger-tip control by means of a simple hydraulically assisted winch, and the powerful newly designed engine supplies ample power for traction and loading in the toughest conditions. Maintenance is simple and spare parts are available everywhere. The four essentials are steering, gear changing, scoop control, and servicing, a full range of loader parts being available from Chaseside agents and tractor spares from every Fordson dealer.—*Chaseside Engineering Co., Ltd., Station Works, Hertford.*

W. H. A. Robertson

SINCE W. H. A. Robertson & Co., Ltd., published the first edition of The Identification of Threading Dies in 1948, 11,000 English and 2,000 French copies have been sent all over the world. A 48-page thread rolling dies edition of the handbook has now been published. It identifies some 300 chaser dies, with over 100 full illustrations, and gives details of no fewer than 60 different series of the principal screw thread systems of the world. It is the publishers' hope that this extended service will benefit those concerned with threading dies. They claim that no other firm makes such a comprehensive range of dies and chasers to suit British, American, and Continental dieheads, threading, and thread rolling machines, and diestocks. —*W. H. A. Robertson & Co., Ltd., Lynton Works, Bedford.*

Thomas Summerson

WE have received from Thomas Summerson & Sons, Ltd., a copy of the *Summerson Book of Railway Sidings*, a lavish and beautifully produced publication of 72 pages and stiff cover, which will not only interest the engineer who is immediately concerned with the laying and maintenance of works sidings, but will appeal to all, old and young, who are interested in railways. The brochure has been prepared to illustrate the types of work which Summersons can undertake. Because railway sidings vary according to site conditions and the demands of particular traffic, it is not practicable to catalogue everything which the Company manufactures. It specialises, on both major and minor projects, in the manufacture and installation of trackwork systems which it designs with a view to the longest life and lowest possible running costs.

The first 10 pages remind the reader never to underestimate the part experience plays in the designing, manufacturing, and laying of sidings, the investment value of sidings made of best materials well designed and truly laid; and the true economy and extra efficiency of sidings that are regularly inspected by experts. Then follows a complete catalogue of crossings, switches, crossways, fishplates, chairs, stops, rails, and lever boxes, with blue prints, detailed photographs, and panoramic views illustrating general layout. The two final pages are devoted to an illustrated glossary of railway siding terms. The front cover bears a coloured picture of railway siding construction in progress, and the back cover carries a reminder of two separate services designed to save railway siding operators a good deal of money every year—Summersons' inspection service and maintenance service—details of which may be had on application or discussed with a technical representative on site.—*Thomas Summerson & Sons, Ltd., Albert Hill, Darlington, Co. Durham.*

Elcontrol, Ltd.

ELCONTROL, LTD., who set out about three years ago to specialise in industrial electronic control equipment, has outgrown its original factory and has just moved into larger premises at Wilbury Way, Hitchin. The Company's range of standard items is being increased and now includes a photo-electric pyrometer for resistance welding and heat treatment control, an electronic weld timer for use with all types of resistance welding machines, and an electronic proximity switch having very wide applications.

The Company also announces advances in the realm of automatic ignition and flame failure control of gas fired installations and has issued revised literature on this subject. Sales headquarters remain at 10, Wyndham Place, London, W.1 (Ambassador 2671) where all enquiries are welcomed.

Automotive Products

THE August number of *Precision*—house journal of Automotive Products, Ltd.—describes the service school for those who sell and service automobile and aircraft equipment manufactured by the Company which grew out of the courses organised during the war years, when 5,000 instructors and technicians passed through. At present, some 300 to 400 visitors pass through the school every year, drawn from every sphere of commerce and industry, with a fair percentage from overseas. Some two dozen countries have been represented in the many courses which have been held, the majority of the overseas visitors being representatives from vehicle manufacturers' distributors. Others who take advantage of the school include vehicle manufacturers and aeroplane constructors, factors or selling agents, and municipal and government transport undertakings. Considerable demands are being experienced for courses dealing with the various aspects of the Lockheed hydraulic servo equipment.

Siebe, Gorman

A NEW leaflet has been issued by Siebe, Gorman & Co., Ltd., describing the 'Microfilter' dust respirator which owes its inception to the Committee on Industrial Health of the British Steel Founders' Association. The Committee asked the manufacturers to produce an efficient, comfortable respirator capable of being worn for long periods under the arduous conditions involved in the finishing of steel castings.

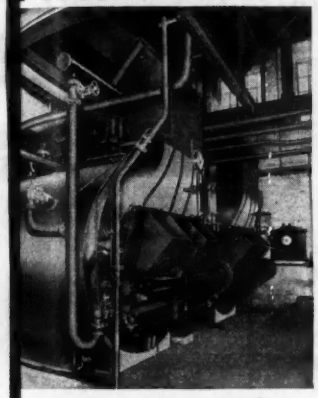
These operations are productive of quantities of finely divided silica, which give rise to silicosis in workers who are not adequately protected. The respirator has been submitted to the tests prescribed by the Ministry of Labour and National Service, and bears the Ministry's registered certification mark. A condition of the use of this mark is that the Ministry's inspectors periodically select for test samples of materials and of finished respirators. The respirator is approved for use under the Asbestos Industry Regulations, 1931.—*Siebe, Gorman & Co., Ltd., Neptune Works, Davis Road, Tolworth, Surrey.*

Heating

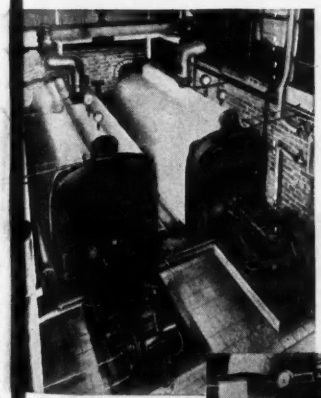
Power Generation

Industrial Processing

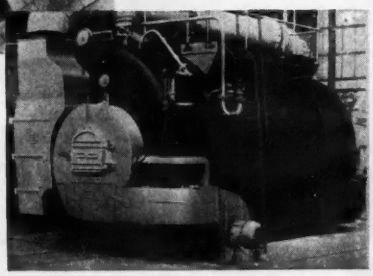
PAXMAN BOILERS



The three principal functions of a boiler are Heating, Power Generation and Industrial Processing. "Paxmans" with their main types, Economic, Ultranomic, Waste Heat and Vertical Multitubular have the complete answer to all boiler problems whatever the industry or application.



nstall a Paxman oiler and ensure wer fuel costs and inimum maintenance charges.



DAVEY, PAXMAN & CO. LTD., COLCHESTER

TELEPHONE 5151/7 TELEGRAMS PAXMAN, COLCHESTER

B.28

1 IN A MILLION

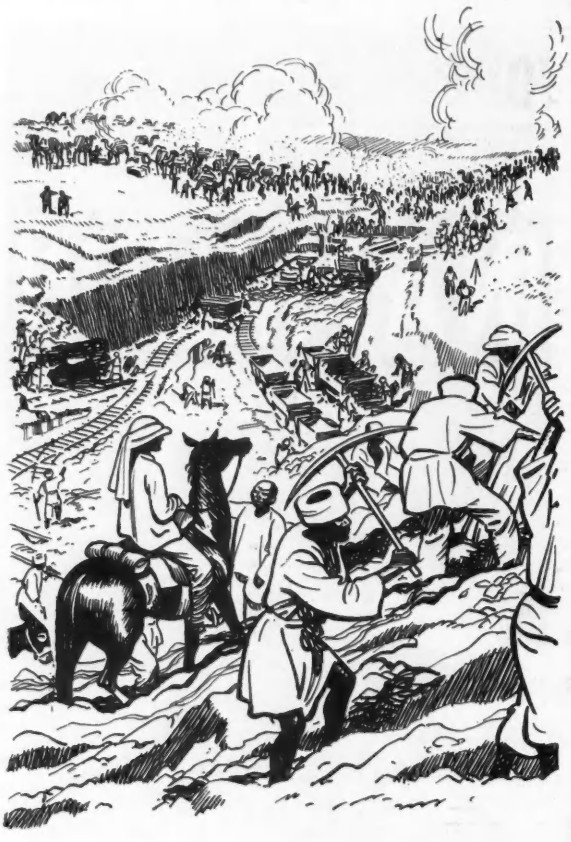
HOT BRASS PRESSINGS AND MACHINED BRASS WORK OF HIGH QUALITY

MESSENGER & SONS (BIRMINGHAM) LIMITED

TELEPHONE VICTORIA 1071/2

GREET, BIRMINGHAM, 11

TELEGRAMS MESSENGERS BIRMINGHAM



MOMENTOUS *Measures*

A CONNECTING MEASURE No. 37.

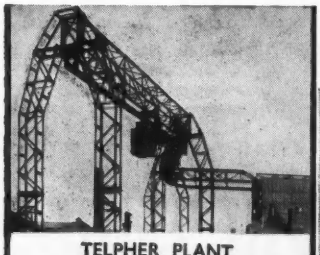
Whatever else Disraeli did
To bring his name renown,
He recognised a bargain
And he paid for it cash down.
For in that Suez Canal affair
He got the British Lion's share!

In 1869 the Suez Canal was opened to ships of all nations—a measure of great interest to Britain, who, however, had no financial interest in it. Six years later the Khedive of Egypt, a large share-holder, found himself in need of ready money. The opportunity to buy his holding was promptly snapped up by Disraeli . . . . . a wise investment, which, in recent months, has required our undivided attention. Our modern measure—the A. & M. Meter—also a wise investment, is to be found in practically every corner of the Empire where gas is used.

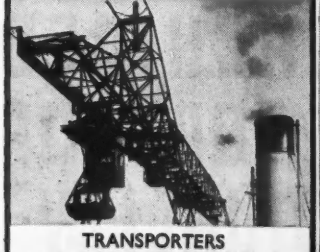
THE "A & M" METER

A MODERN MEASURE for the Gas Industry

ALDER & MACKAY LTD.
New Grange Works, Edinburgh
Bradford, Manchester, London, Belfast & Cork



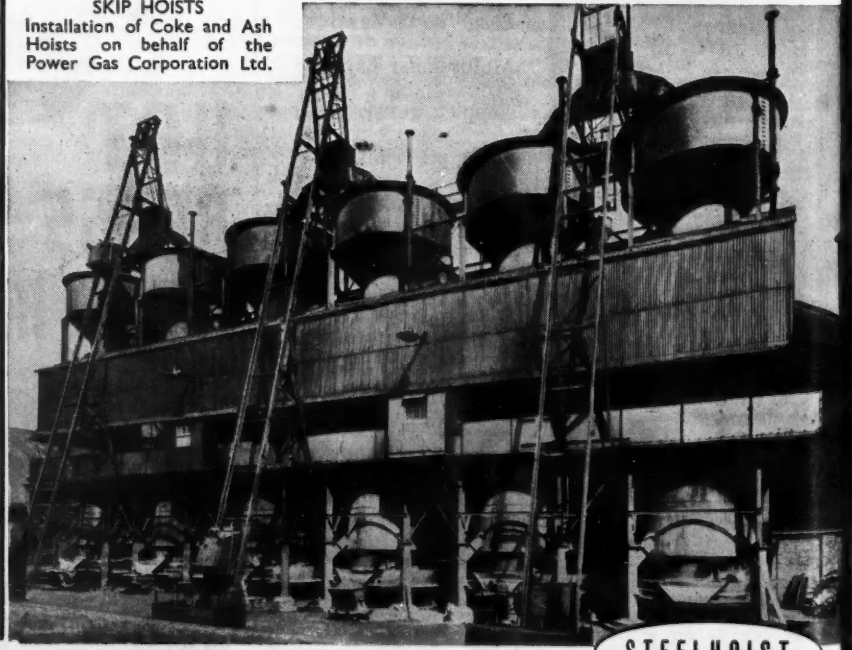
TELPHER PLANT



TRANSPORTERS

WAGON TIPPLERS

SKIP HOISTS
Installation of Coke and Ash Hoists on behalf of the Power Gas Corporation Ltd.



Plant for the movement of material in bulk

STRACHAN & HENSHAW LTD

Steelhoist Works. Bristol 2. Tel: 77664.

STEELHOIST

Bind your JOURNAL each week

No loose copies to be mislaid

We offer Journal readers a simple method of temporarily binding their copies as received week by week. No time lost searching for a particular issue; Journals removed and replaced in a few seconds. Designed to hold 13 issues, and whether completely or only partially filled the book effect is always maintained.

Gold lettered on the spine complete with instruction sheet.

Price 12/6 each plus 9d. postage.

Obtainable from:

WALTER KING, Ltd., 11, Bolt Court, Fleet St., London, E.C.4

PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates : Home and Empire :- 52/- per annum ; Foreign :- 60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements : All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements : Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS OFFICE : 10, Union Street, Birmingham.

NORTHERN MANAGER : W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone : Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone : CENtral 2236-7. Telegrams : Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright. Highest prices paid for Spent Oxide.

Send your enquiries to

AS PURIFICATION & CHEMICAL COMPANY LIMITED

ESTABLISHED 1873

ALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.

Telegrams : "Purification, Stock, London." Telephone: London Wall 5077

FIRE!

WHERE'S YOUR

NU-SWIFT?

The World's Fastest Fire Extinguishers —for every Fire Risk

Pressure-operated by sealed CO_2 Charges

NU-SWIFT LTD · ELLAND · YORKS

In Every Ship of the Royal Navy

"KLEENOFF" *

THE COOKER CLEANER

"KLEENOFF"

FIBRE BRUSHES

RUBBER MOPS

KETTLE DESCALER*

(NEW "KLEENOFF" PRODUCT)

* *For resale to the public, and in bulk for Works use.*

BALE & CHURCH, LTD.

7, CROMPTON WAY, CRAWLEY, SUSSEX.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

ROBERT DEMPSTER & SONS, LTD

ELLAND, YORKS.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT, to be engaged on development of plants and experimental work in all Gasworks processes, including plant tests.

Applicants must be progressive, have completed Military Service, and have had practical experience. They must also hold at least one of the following qualifications, Higher Grade Certificate (Manufacture) of the Institution of Gas Engineers, Gas or Chemical Engineering Degree or similar qualification.

Salary commensurate with qualifications and experience; five-day working week and superannuation scheme.

SCOTTISH GAS BOARD

KILMARNOCK GROUP

NEWMILNS DISTRICT

APPLICATIONS are invited for the position of DISTRICT MANAGER at the Newmilns District Gas Undertaking.

Applicants must be experienced in the operation and supervision of a Gas Undertaking and have sound practical experience in the control of horizontal retort settings, distribution practice and general office routine.

The salary applicable to the post will be within Grade VI Provincial "B" of the National Salary Scale (£460-£540 per annum) with free house, coal and gas. Placing on the salary scale will be according to qualifications and experience.

Applicants should state whether or not the position they presently hold is superannuated, and the successful candidate may require to undergo a medical examination.

Applications stating age, training, experience and qualifications, giving the names of two referees should be addressed to the undersigned within 14 days of the appearance of this advertisement.

ROBERT FIFE,
Group Manager.

Riverbank Gas Works,
KILMARNOCK.
August 19, 1952.

EAST MIDLANDS GAS BOARD

SHEFFIELD AND ROTHERHAM DIVISION

TECHNICAL ASSISTANTS

DISTRIBUTION

APPLICATIONS are invited from suitably qualified persons for the following appointments in the Sheffield and Rotherham Division:—

1. DIVISIONAL TECHNICAL ASSISTANT.

Applicants should have had practical experience in Mains and Service Work generally and have considerable knowledge of the planning and design of distribution and reinforcement projects. The salary will be in accordance with Grade APT VII of the National Salary Scales for Gas Staffs and the initial placing on the scale will be dependent upon qualifications and experience.

2. TECHNICAL ASSISTANT, MAINS DEPARTMENT, SHEFFIELD.

Applicants should have had practical experience in Mains and Service work generally and some knowledge of the planning and design of distribution and reinforcement projects. The salary will be in accordance with Grade APT IV or V of the National Salary Scales for Gas Staffs and the initial grading will be dependent upon qualifications and experience.

The posts are superannuable and the successful applicants may be required to pass a medical examination. Applications, stating age, qualifications and giving details of experience, together with the names of two referees, should be addressed to reach the undersigned not later than August 31, 1952.

C. C. WOOD,
Divisional General Manager.

Gas Offices,
Commercial Street,
Sheffield, 1.
August 15, 1952.

NORTH THAMES GAS BOARD

SENIOR DRAUGHTSMEN are required in the Chief Engineer's Department at Westminster:

(*a*) experienced in the design of steel structures.
(*b*) experienced in the design of reinforced concrete structures and general civil engineering work.

Starting salary range £700-£825 per annum, according to age, qualifications and experience.

The appointments are of a permanent nature after a probationary period and pension arrangements will be discussed with short list candidates.

Applications giving age, qualifications and experience should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, London, W.8. quoting reference 666/39.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION

COVENTRY DISTRICT

SENIOR HOME SERVICE ADVISER

APPLICATIONS are invited for the above position at a salary within Grade VI (Female) (£380 to £444 per annum) of the National Salary Scales, according to qualifications and experience.

Candidates should have had at least two years' training in Domestic Science and hold an appropriate Diploma or Certificate and have had considerable practical experience.

The post is superannuable and the successful applicant may be required to pass a medical examination.

Applications, stating age and giving details of training and experience, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION

ASSISTANT MECHANICAL ENGINEER—

BIRMINGHAM DISTRICT

APPLICATIONS are invited from suitably qualified persons for the above position.

The salary for the post will be within Grade XII (£720-£845 per annum) of the National Salary Scales.

The successful applicant will be required to assist the Mechanical Engineer in the maintenance work of gas works plant and the installation of new plant. Candidates should have served an apprenticeship in engineering and have had further experience in general engineering and steam plant. Some knowledge of mechanical handling plant will be an advantage. Possession of the Higher National Certificate in Mechanical Engineering or Corporate membership of the Institution of Mechanical Engineers or an Engineering Degree is essential.

The post is superannuable and the successful candidate may be required to pass a medical examination.

Applications, stating age, training, qualifications and experience, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Birmingham and District Division, Gas Offices, Edmund Street, Birmingham, 3, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WALES GAS BOARD

PONTYPOOL UNDERTAKING

SHIFT SUPERINTENDENT

APPLICATIONS are invited for the position of SHIFT SUPERINTENDENT at the above Undertaking.

Candidates should preferably have had experience on Woodall-Duckham Continuous Vertical Retorts, and should have had technical training in all gasworks ancillary plant and equipment. Preference will be given to the Candidates holding the Institution of Gas Engineers Higher Grade Certificate.

The salary will be within Grade VI—Administrative, Professional and Technical—of the National Joint Council for Gas Staffs—Provincial 'A' £475-£555 per annum plus housing accommodation, rent free, which will be provided by the Undertaking. The successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, with two recent Testimonials, should be posted to the undersigned not later than fourteen days after the appearance of this advertisement.

J. POWDRILL, M.B.E.,
General Manager.

Wales Gas Board,
Pontypool Undertaking,
Hanbury Road,
Pontypool, Mon.

WALES GAS BOARD

1. MANAGER—LLANIDLOES GAS UNDERTAKIN

APPLICATIONS are invited for the abo appointment within the salary grade A.P.T. V (£540 per annum maximum inclusive of emoluments a house will be available). The substantial, immedia and prospective development of this Undertaking offe opportunities to an energetic and keen manager.

Applicants should possess sound experience in g distribution and manufacture and should be capable carrying out successfully the administrative and ot duties of the post. The successful applicant may required to pass a medical examination and to subscri to any superannuation scheme which the Board m introduce.

Applications, giving age, qualifications, prese position and experience, together with the names two referees, to reach the undersigned within ten da of the appearance of this advertisement.

2. MANAGER—FFESTINIOG UNDERTAKING

Applications are invited for the above appointme within the salary grade A.P.T. VIB.

Applicants should possess sound experience in g distribution and manufacture and should be capable carrying out successfully the administrative and oth duties of the post.

The successful applicant may be required to pass medical examination and to subscribe to any supe annuation scheme which the Board may introduce.

Applications, giving age, qualifications, prese position and experience, together with the names two referees, to reach the undersigned within ten da of the appearance of this advertisement.

C. B. MAWER,
Secretary.

1 & 2, Windsor Place,
Cardiff.

EASTERN GAS BOARD

TOTTENHAM DIVISION

MECHANICAL ENGINEER—

DIVISIONAL OFFICE

APPLICATIONS are invited for the abo appointment from candidates between 27 a 45 years of age who are Corporate Members of t Institution of Mechanical Engineers or hold equivalent qualification.

The responsibilities cover the eight gas works the Division and the duties will mainly comprise:—

(*a*) Supervision of all mechanical requirements und the Factories Acts, *e.g.*, steam boilers and press vessels, gasholders, lifting appliances, etc.
(*b*) Safety precautions.
(*c*) Inspection of mechanical plant at makers' wo and supervision of erection.

(The Works Engineers in each locality are responsi for mechanical maintenance).

The successful candidate will be required to pas medical examination and to join such contributo superannuation scheme as the Board may adopt.

The appointment will be made within Grade A.P. XI Metropolitan (£700-£825) of the National Sal Scales for Gas Staffs.

Applications, stating age, qualifications and experie should reach the Divisional Personnel Manager, Wood House, 658, Lordship Lane, London, N.22, not l than September 13, 1952.

August 6, 1952.

PLANT WANTED

WANTED:—REGULAR SCRAP GAS METE AND PARTS. Best prices paid. Offers to; Mitcham Smelters Ltd., Red House Road, Croyd Surrey. *Tel.*: THOrnton Heath 6101 (Private Bra Exchange).

BUFFALO EJECTOR

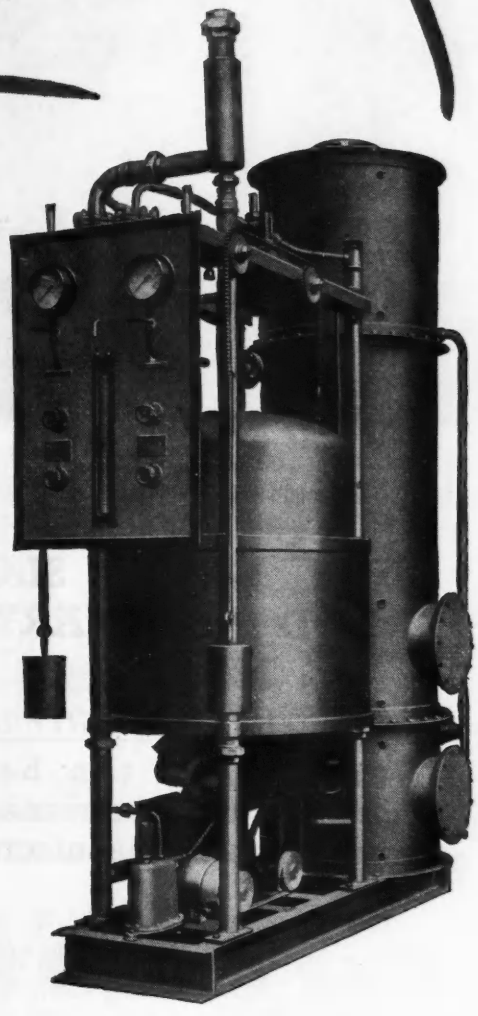
For pumping water or other liquids.
Send for List:—
GREEN & BOULDING, LTD.
162a Dalston Lane, London, E.8

Your

MODERN GAS SUPPLY

at the touch of a button!

The Holmes-Mallet Plant illustrated delivers 6-8000 cu. ft. per hour of a mixture of butane and air which can be used for domestic or industrial purposes.



ADVANTAGES

- **The plant is simple and can be supervised by one operative.**
- **It is arranged for manual push button stop and start or controlled automatically from holder.**
- **The calorific value of the mixture can be altered to suit requirements, and will be constant at any one setting.**
- **The plant occupies little space.**
- **It is designed to comply with Government Safety Regulations.**

The HOLMES-MALLET BUTANE/AIR PLANT

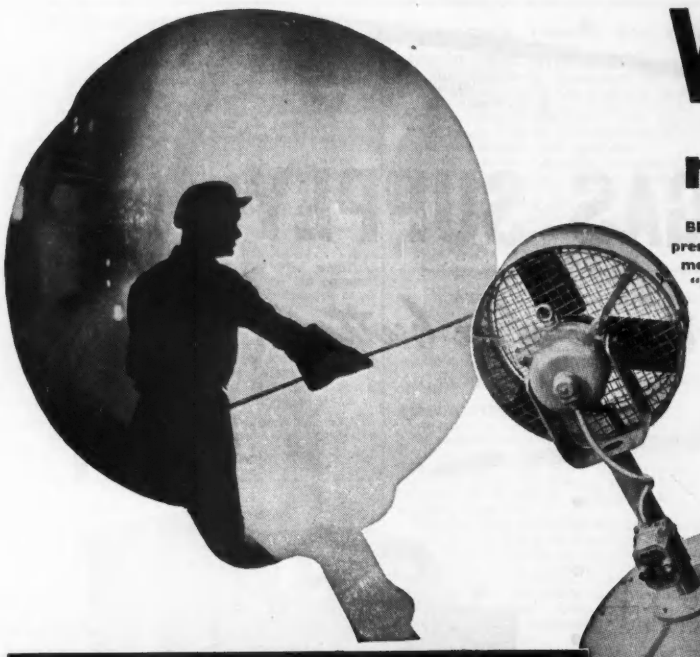
W. C. HOLMES & CO. LTD.

FOUNDED 1850 HOLMES HUDDERSFIELD

HUDDERSFIELD • LONDON • BIRMINGHAM

Tel: Huddersfield 5280 London: Victoria 9971 Birmingham: Midland 6830

©1678



WHY

man-cooling?

BECAUSE MEN CANNOT WORK at full stretch under the oppressive conditions existing in industrial "hot spots" without some means of relief. Often they resort to "taking a breather". But "breathers" are costly and time-wasting.

Consider the alternative.

The "Tornado" method of man-cooling definitely encourages production all the time. Man-cooling fans deliver for as long as is necessary, a brisk, cooling air current which relieves excessive body heat and improves breathing conditions. Designed particularly for use in the "heavy" trades they combine an easy portability with robust construction — two essential characteristics.

If your concern is for workers in iron and steel works, foundries, boiler houses, gas retort houses, glass works or "lighter" industries where efficiency is bound up with the maintenance of comfortable working conditions then you should see Publication No. 9/7.

A copy is waiting for you.

ASK FOR PUBLICATION NO. 9/7

Keith Blackman LIMITED

MILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone: Tottenham 4522 (twelve lines). 'Grams: "Keithblac, Norphone, London."

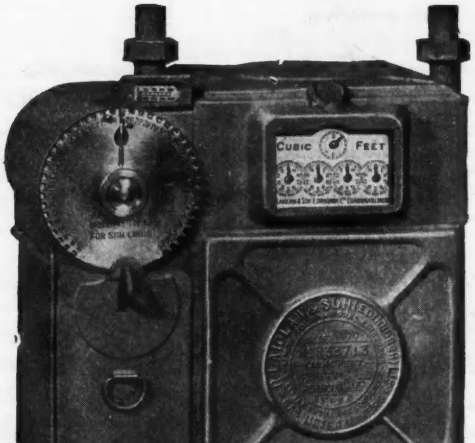
BRANCH OFFICES: AT MANCHESTER, BIRMINGHAM, LEEDS, GLASGOW, NEWCASTLE-ON-TYNE, PENARTH near CARDIFF, AND BELFAST

486/2/GJ

HIGH GRADE SLOT AND ORDINARY METERS

I.G.E. AND HIGH CAPACITY LISTS

Nothing but the best materials and workmanship used in their manufacture



R. LAIDLAW & SON (Edin.) Ltd.

SIMON SQUARE WORKS, EDINBURGH

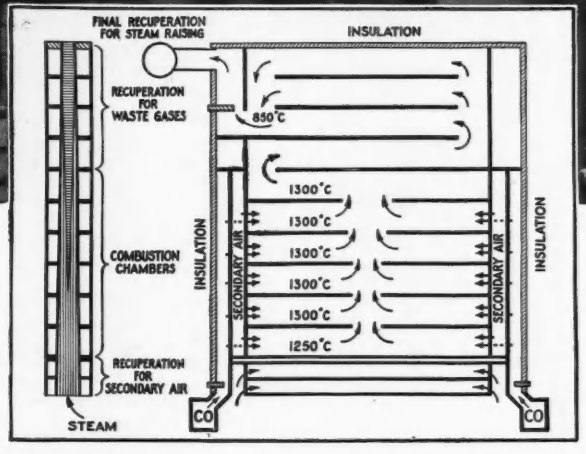
8/9, LUDGATE SQUARE, LONDON, E.C.4

Repairs—Parts Supplied

Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C.4. Wednesday, August 27, 1952

"Balanced Heating"

MEANS ECONOMICAL GAS—MAKING



Great reductions in the amount of fuel required for the carbonization process have been recorded in the "Balanced Heated" settings of the Glover-West continuous vertical system.

This is due to two main factors. The retorts are heated by *primary* combustion of producer gas which enters the combustion chambers at *both* sides of the setting. Even heating of the retorts ensures maximum utilization of heat and eliminates high local temperatures and fuel wastage.

In addition, improved control of individual combustion chamber temperatures ensures maximum gas production from all coals.

* *Illustration shows a "Balanced Heated" setting under construction.*

West's Gas IMPROVEMENT CO. LTD.

ALBION IRONWORKS · MILES PLATTING · MANCHESTER 10

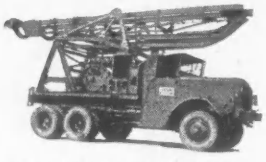
Telephone: COLlyhurst 2961. Telegrams: Stoker, Manchester.

London Office: Columbia House, Aldwych, W.C.2. Phone: HOLborn 4108-9 Grams: Wesgasco, Estrand.

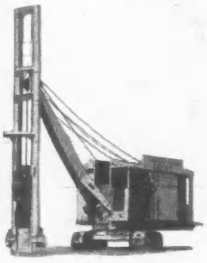
WEST'S-PILING

PROVIDES SECURE FOUNDATIONS FOR ANY STRUCTURE

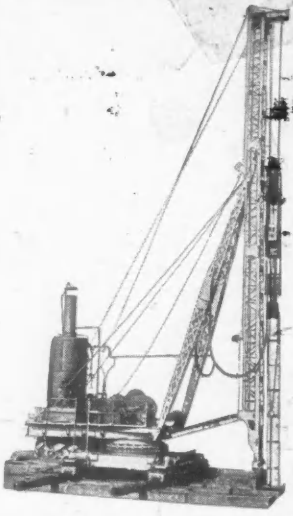
PLANT FOR DRIVING OUR SPECIALISED SYSTEM OF PILING



(A) Mobile petrol-diesel outfit for small contracts.
2-ton Drop Hammer.



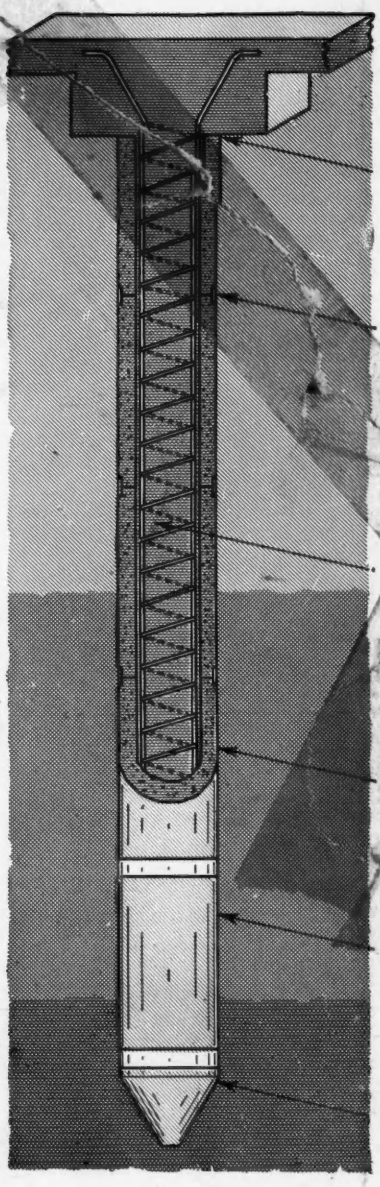
(B) Small mobile diesel outfit for undulating sites.
3-ton Drop Hammer.



(D) Typical steam frame for extensive sites.
4-ton Steam Hammer.

(C) Medium mobile diesel outfit for undulating sites.
3-ton Drop Hammer.

(E) Large mobile diesel outfit for undulating sites.
3-5 ton Drop Hammer.



SPECIAL FEATURES

TOP PILE SHELL ONLY CUT TO SUIT PILECAP

WATERTIGHT STEEL BAND AT JOINTS BETWEEN STANDARD LENGTH PILE SHELLS

CONCRETE CORE AND STEEL REINFORCEMENT NOT FATIGUED AS IT IS PLACED AFTER SET IS OBTAINED

REINFORCED PRECAST CONCRETE SHELLS ENSURING A CONSTANT CROSS SECTION

SKIN FRICTION RETAINED AS INITIAL SET IS NOT DISTURBED

SOLID CONCRETE SHOE TAKES DRIVING STRESS AND PENETRATES INTO LOAD BEARING STRATA

NO WASTAGE — PILE SHELL DRIVEN IN DESIRED

NO COSTLY EXTENSIONS STANDARD SECTIONS TO RESISTANCE

WEST'S PILING & CONSTRUCTION CO., LTD., COLUMBIA HOUSE, ALDWYCH, LONDON, W.C.2

Telephone : HOLBORN 4108

Plant Depot: Bath Road, Harmondsworth, Middlesex. Telephone: West Drayton 2288. *Midland Office:* 83 Edmund Street, Birmingham 3. Telephone: Central 1415.
Northern Office: Albion Ironworks, Manchester 10. Telephone: Collyhurst 3049. *Scottish Office:* 169 Hamilton Road, Glasgow, E.2. Telephone: Shettleston 2917.